DECEMBER 1960

THE Airman

OFFICIAL JOURNAL OF THE AIR FORCE

CHRISTMAS
1960

It was the most wondrous light a world could hope to know,
That great star making gold Judea's hills and all below
To light paths for shepherds awed and Magi grand to a manger bed
Where the newborn Christ Child lay a humble head.

The Prince of Peace had come and through sleepy hours so long still
Angel choirs hymned the tidings: On earth peace to men of good will.
No room for Him had any inn that night, 'though for lesser guest by far —
Odd, these were deaf to the message, nor even beheld the star.

While our dying year has been ominous, tense, ne'er burns the star so bright
For servants of peace and the trusting who hold true to the way thru the night.
No dire threats for them mute the music, nor rantings vicious and wild,
They walk on free, firm hearted, their hands reaching out toward the child.

— William A. Kinney

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THE Airman

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THE AIRMAN is primarily a medium for the exchange of ideas and information among Air Force personnel. Readers are encouraged to submit articles, short subjects, photographs, and artwork.

LETTERS TO THE EDITOR

Educational Benefits

Sir: I have received contradicting answers to this question from several sources. I hope you can straighten it out for me. I entered service in June 1951 and reenlisted in June 1955. Now, I will be discharged in June 1961. Will I be eligible for the school portion of the Korean GI Bill?

Willington Rolle
Davis, Calif.

• *According to the best information available to us, you will not be eligible. The fact that you have been discharged once without taking up educational benefits within the alloted time disqualifies you. Primarily, the Bill was designed to aid those returning to civilian life and your decision to remain on active duty caused you to sacrifice these benefits.*

★ ★ ★

Cross-Training

Sir: Could you please outline the procedures which are necessary to qualify for and undergo cross-training into a field which offers proficiency pay?

SSgt. Eddie Garland, Jr.
APO 925, San Francisco, Calif.

• *This is a question that continues to arrive in our mail bags. For those interested in cross-training, or retraining, we can only refer you to your personnel officer, and the regulations which govern such action. For those who would like to study the regs before applying, the most relevant are AFRs 39-8 and 39-9.*

★ ★ ★

Who Were They?

Sir: The recent mid-air recovery of the *Discoverer XIV* capsule was a real accomplishment and a very important step in our nation's man-in-space program. The very fact that it took 14 attempts to accomplish this feat is proof enough that it was extremely difficult and required the precision teamwork and efficiency of a great many Air Force people. I share the feeling of most other Americans that the aircrew that snatched the capsule deserves all the praise that it has received. I am proud to wear the same uniform that they do.

However, I think that just as much

(Continued on page 30)

by Gen. Laurence S. Kuter
Commander in Chief NORAD

DURING an international conference of electronic computer experts held in Paris last year a new word, used glibly, found its way into popular parlance. The word was *nanosecond*. By scientific definition, a nanosecond is a measurement of time: one thousandth of a millionth of a second.

A nanosecond represents that portion of eternity required for a computer to accomplish a mathematical function. It has great additional significance. It represents rapid advancement that has been made in electronic devices designed to ease man's burden in assimilating, memorizing, storing, and using myriad mountains of trivia, which when taken as a whole will provide data that may well determine the course of our civilization's history.

Although we have seen advancements in every facet of the sciences which apply directly to the weapon systems and devices that are part and parcel of the defense structure, none of these advances can compete with the strides that have been made in the speed and accuracy of mathematical computation.

Computers, as represented by the state of the art today, are a thousand times faster than those of three years ago. They are a million times faster than the best that existed 10 years ago. However the advance in the speed of computation is not as important as the rate of this technological advance.

In aerospace defense we stand on the edge of the 60s, facing the air-breathing threat of today and looking forward to a tomorrow that holds the certainty of an ICBM threat, not far distant, the requirement to defend against hostile satellites. In providing a defense for our country against aerospace threats we are increasingly dependent upon electronic devices for computations, analyses, and perhaps, tactical decisions.

It was but 10 years ago that we actually embarked on an active air defense program. It was in August 1949 that the first mushroom cloud blossomed behind the Iron Curtain signalling an end to U. S. atomic weapons monopoly. Russian atomic-weapons ownership coupled with the initiation of the Korean conflict dispelled any doubts about the need for an effective air defense.

In June 1950 our warning systems consisted of antiquated World War II radars. Propeller driven *Mustang* day fighters and antiaircraft cannon were our weapons. For control we depended upon the British system which had been devised for the defense of the United Kingdom in 1940. This system concerned itself with preparation of defenses against the TU-4, an excellent copy of the B-29, then Russia's only first-line bomber.

Intercontinental ballistic missiles or earth-orbiting satellites, capable of reconnaissance, weapons delivery and warning were known in the public domain only through the well drawn comic strips of Buck Rogers and Flash Gordon. UNIVAC represented the ultimate in electronic "brains." This was in 1950. And, in 1950, the control system which won the Battle of Britain could still cope with the TU-4.

In the decade since 1950, planners have perservered. Requirements for weapons and systems were planned and stated. Planned improvements were invented, designed, developed, built and placed in the hands of people trained to get the most out of them.

Today our current air defense system has a respectable degree of capability against the air-breathing weapon threat. This system, under the operational control of NORAD, has resulted from a pooling of the best talent that the Air Force, Army, Navy, RCAF, and industry could muster.

Military history catalogs a continuing struggle by defensive systems to close the gaps created by advances in the offensive. From caveman-launched rock to Canaveral-launched ICBM this has been the pattern. There is no evidence to indicate that this pattern will change.

Recent introduction of *Hound Dog* air-launched ballistic missiles into the SAC inventory is a case in point. These missiles greatly enhance the military potential of SAC's forces and provide new, more complex problems in target acquisition and destruction for the Soviet's air defenders. It is unwise to assume that like systems will not be introduced into the Soviet long-range bomber force, thereby posing those same problems for NORAD.

Current operational NORAD interceptors and ground-to-air missiles cannot cope effectively with missiles of the *Hound Dog* type. It is obvious that defensive measures must be provided otherwise much of our great population-industry complexes on both coasts lie naked before a new and effective type of nuclear missile attack.

The U. S. Senate has released testimony showing that NORAD accepted a plan to reduce our F-106, F-102, and F-101 squadrons a year ago coordinated with the plans to provide a number of F-108 squadrons. The F-108 could move at Mach 3 to the DEW line or 1,000 miles to sea, search a wide area and lock multiple atomic missiles on carriers from 0 to 100,000 feet altitude long before they could launch air-to-ground missiles or otherwise attack North America. In the past few months, the planned reduction of F-106s, 102s, and 101s has been accelerated, although the F-108

AEROSPACE DEFENSE OF NORTH AMERICA

program on which that reduction was premised has been cancelled.

In NORAD's opinion, this cancellation is an open invitation to the competitive, prestige-conscious Soviets to develop a supersonic bomber with range enough to strike North America with one refueling. In fact Secretary Sharp stated ". . . we know they are now testing their first supersonic bomber." The appearance of such a bomber may force a crash program for a Mach 3 interceptor which may be no more efficient but far more expensive than the F-108. NORAD believes that the early development of the F-108 and its introduction into our air defense system is still a strong military requirement.

The Semi-Automatic Ground Environment (SAGE) system provides to NORAD a command and control system that, though much mentioned, is not thoroughly understood.

In aerospace defense application, data from the many radars of a SAGE sector are reduced to a form intelligible to the computer and sent to it automatically and instantaneously over land lines and special radio communications lines. Information is also provided by the early warning systems and other media. The computer also stores previously determined tactics and calculates for the commander where he can attack incoming targets using interceptors and missiles of his selection. The computer directs these selected weapons on proper courses to intercept and destroy the targets.

A year ago we counted on keeping track of all aircraft in North American air space and effectively assigning long-range atomic weapons to those we knew were hostile by a secure command and control system of solid state computers known as hardened SAGE super combat centers. The hardened super combat center program has been cancelled. Soft SAGE, with which we are left, does not have the capacity to handle both civilian and military air traffic and thus greatly reduces our ability to differentiate between friend and foe.

Soft SAGE is provided no protection whatsoever against blast. With no SAGE, it becomes almost impossible to assure that our limited number of long-range atomic *Nike Hercules* and *Bomarc* missiles or any fighter-interceptors are assigned to separate targets, almost impossible to assure that they are not firing on

"The F-108 could move at Mach 3 to the DEW line or 1,000 miles to sea, search a wide area and lock multiple atomic missiles on carriers . . . before they could launch air-to-ground missiles . . ."

DETECT, INTERCEPT, IDENTIFY, DESTROY

friendlies or firing on each other. In World War II we had examples of the disasters that occur when air defense weapons are not centrally controlled, and those were short-range non-atomic weapons.

In late September NORAD actually entered the aerospace defense era. Operational data from the Thule, Greenland, Ballistic Missile Early Warning System site flashed into the NORAD Combat Operations Center at Colorado Springs and was pictured on the new Iconorama display panels there.

This event marked more than the introduction of another warning system. It placed in bold relief a problem perhaps equal in importance to the need for an ICBM missile defense: The absolute necessity for a single primary point of computerized acceptance of attack-warning indicators from all sources. Any indicator system is subject to some type of false alarms. In the missile era, false alarms could be catastrophic. With all indicators terminating in the same primary facility, the credence of alarms from one, two, or all systems can be established.

Currently, all data from the various systems positioned to give warning of an air-breathing weapon threat terminates in the NORAD COC.

Information from all BMEWS sites will feed into NORAD's computers.

Midas and other future systems designed to provide warning data of a tactical nature will have credence only as they relate to an overall computerized analysis of all indicators, and will then provide sound basis for the decisions which will direct our weapons to strike hostile targets with such speed and accuracy that we destroy before we are destroyed.

". . . there is a clear requirement for . . . more vigorous action in development, construction and placement of an effective anti-ICBM defense system . . ."

Initiative lies with the aggressor. Introduction of more sophisticated weapons and the resultant compression of time increases the value of initiative to him. It follows that as we strive for greater automaticity, the requirement for greater centralization of control becomes mandatory. Any system or procedure that extends our reaction time invites disaster.

Optimum automaticity in warning-data processing, while a highly desirable goal in aerospace defense, may offer pitfalls to the unwary.

". . . we are increasingly dependent upon electronic devices for computations, analyses, and perhaps, tactical decisions."

". . . we must select and train the most competent personnel available to the defense department . . ."

Two highly reputable scientists, Dr. Edward Teller of the University of California, and Professor Norbert Weiner of Massachusetts Institute of Technology, have warned that the computer possesses the potential of developing "a mind of its own" based on random trial experience and might develop unforeseen strategies at a rate that would baffle its programmers.

Although theoretically subject to human criticism, such criticism may be ineffective until after it is relevant. Professor Weiner has stated, "By the very slowness of our human reactions, effective control of our machines may be nullified. To be effective in warding off disastrous consequences, an understanding of our man-made machines must develop at an equal pace with the performance of the machine."

It would seem obvious then if we are to utilize the computer to its greatest capacity, we must at the same time select and train the most competent personnel available to the defense department in the proper care and programming of the computer if we are to be its master rather than its victim.

Our most immediate and pressing requirement in aerospace defense is for a defense against the intercontinental ballistic missile.

We have seen progress in aerospace operations reach such a pace that it is only through several spectacular successes within a single day that news of the events reaches the front pages of our newspapers or stimulates public interest. We have, through application of the best efforts of the scientific community and excellent coordination between departments of the government and industry, sent satellites millions of miles into space and maintained continuous communication. Other projects utilizing this same application and coordination have produced data in hundreds of fields ranging from immediately useful material such as that gained from *Tiros* and *Echo* to academic material on radiation, electromagnetic fields, and effects on living organisms in true space environments.

These projects are the result of positive thinking and coordinated vigorous action.

Progress in the Soviet ICBM program is well known. They have developed missiles possessing operational capabilities sufficient to deliver megaton-yield nuclear warheads on any point on the North American Continent. Opinions regarding the Soviet operational ICBM inventory vary only in number. In the face of this known threat, a threat that could become actuality upon a decision by Soviet leaders, there is clear requirement for more positive thinking by the scientific community and more vigorous action in development, construction, and placement of an effective anti-ICBM defense system in the NORAD operational inventory.

At the present time, the most advanced project underway in this critical area is being conducted by the Army on the *Nike Zeus* system. This project has experienced considerable success in its research and development program. The Department of Defense has announced future firing tests of the *Zeus* against ICBM targets of the *Atlas* and *Titan* types. NORAD hopes that these tests will produce successes which will result in a decision to initiate production.

As both the Free World and Communism amass more and more highly destructive offensive weapons, we will enter an era of deterrence because of the assurance of mutual suicide. Obviously, the side which can first produce an effective aerospace defense against the other's offensive weapons will enjoy an overwhelming advantage. It would be unthinkable that the Soviets should first produce defenses against our offensive weapons, leaving us, alone, vulnerable to their weapons and consequently to their blackmail and their dictation.

Today, the respective successes of the United States and the Soviet Union with satellites casts a shadow of significant portent. In order to avoid a future gap between our defensive capability and Russia's offensive capability similar to the present gap between our capability to defend against the Russian ICBM and their offensive ICBM capability, we must attack the problem of satellite defense with no less talent and vigor than the Russians are putting into their satellite program.

In aerospace the established defense functions of detection, identification, interception, and destruction must close the gap between the exploding perimeters of the overall aerospace concept.

NORAD believes strongly that an acceptable degree of aerospace defense not only insures survival if deterrance should for any reason fail but will provide the only effective deterrent if and when parity is established between offensive forces. NORAD is dedicated to the proposition that we shall be first to produce an acceptable degree of aerospace defense.

EDUCATION FOR ALL

An interview with Mr. James Moore, Chief of the Student Loan Section, Department of Health, Education and Welfare.

by SMSgt. Hal Bamford

What is the National Defense Education Act?

It is an Act designed to "strengthen the national defense and to encourage and assist in the expansion and improvement of educational programs to meet critical national needs."

Overall the Act contains 10 titles. However, I would think that your readers would probably be primarily interested in Title II, *Loans to Students in Institutions of Higher Education.*

The principal aim of this portion of the program is to assure that no student of ability is denied a college education because of financial needs.

To this end, the Student Loan Program is directed at stimulating and assisting colleges in establishing funds for low-interest loans to such students.

Who is eligible for these loans?

Students either accepted for, or in full-time attendance at a school. Additionally, they must of course be capable of maintaining good grades in their chosen fields of study. Finally, they must need assistance.

Now, I think the key word is probably "need." This is determined under basic criteria by the school staff.

One other factor should be kept in mind. Special consideration will be granted to persons of superior academic background who express a desire to teach in elementary or secondary schools or to those who show special capacities in science, mathematics, engineering, or a modern foreign language.

Are these loans available for graduate study?

Yes, they are. For the purpose of this program, the term bachelor's degree, as used in the Act itself, includes any higher or more advanced degree as well.

Is there any portion of this fund reserved for specific groups such as Armed Forces veterans?

No. In some respects, the title of this Act may be unfortunate in that it gives that impression. However, this is not a "peacetime GI Bill." Neither does it rule out veterans. As I stated earlier, if you qualify and the money is available, you may receive such a loan.

What is the procedure for obtaining a loan?

The institution itself arranges all loans. Therefore, prospective borrowers must apply directly to the financial aid office of the college concerned.

The reason is that each participating school is responsible for providing funds totaling not less than one-ninth of the Federal contribution. In addition, these institutions already have assistance offices in operation and can handle the program without added administrative costs, plus the fact they are in the best position to evaluate student need.

How extensive is participation by colleges and universities?

According to our latest figures, there are approximately 1,400 colleges and universities. These include roughly 85 percent of the national full-time enrollment.

Can such loans be established at universities in foreign nations?

No. Only those in the 50 states, Puerto Rico, the District of Columbia, the Canal Zone, Guam, and the Virgin Islands.

Can these funds be expended in any manner for study abroad?

There are some special cases. However, these are limited to instances in which the student is a full-time enrollee in a participating American school, which has an arrangement with a school in a foreign country. Again, such cases will be decided on individual merit.

What are the principal provisions of the loan?

Students may receive up to $1,000 a year. However, during their period of schooling, the total may not exceed $5,000. While they are in full-time attendance at school, no interest accrues. The same is true during any period of military service up to three years. Also, no repayments are expected during these periods.

Now, I don't want to leave the impression that these

figures are standard. Please remember, these are maximums. Our experience has been that the average is closer to $500 per student. Again, much depends on the institution and degree of student need.

Is the student in any way limited as to how he may spend the funds which he receives?

The only limitation applied here is that the money must be applied to "college-related" expenses. By that we simply mean tuition or required fees such as books, instructional materials and equipment. In the case of the student away from home, he may use it for room and board. The commuting student may apply it to transportation and lunches. In short, almost any necessary expense that may arise as a result of enrolling in or attending school may be "college-related."

How are the loans to be repaid?

Provisions call for repayment of the principal plus accrued interest over a period not to exceed 10 years. These payments are scheduled to begin one year after the student ends his full-time study status.

Now, within this general outline there are several approved repayment plans. The student may select the one which he and officials agree is appropriate.

If, at any time, a person finds himself capable of exceeding the agreed schedule, he may certainly do so and no interest penalty will be exacted.

I think we should cover one other point as well. Loan liabilities are cancelled upon death or permanent total disability of the recipient.

What is the "forgiveness clause" which is applicable to these repayments?

This feature applies to loan recipients who enter the public elementary or secondary teaching profession on a full-time basis after graduation. It provides that up to 50 percent of the total loan and interest may be cancelled.

The provision works in this manner. At the time of entry into teaching a "base amount" is established and 10 percent of this amount is automatically cancelled for every year of teaching. This arrangement may be continued until one half of the loan has been cancelled. Thus, if a graduate taught for five consecutive years, half of the loan may be repaid in this manner.

Must students study certain courses and, if so, which ones?

No. Neither the government nor the schools desire to dictate study courses for participating students.

Regardless of this, however, it must be remembered that the Act was designed to "strengthen national defense" and "meet critical needs." Consequently, as noted earlier, special consideration will be given to students who are studying in specified areas. The wisdom of this can be emphasized by the fact that in 1958, for example, only 14 Ph. Ds. were awarded in meteorology in this country.

How many students are now studying under the program?

At present, we still haven't made a complete tabulation of figures for the current school year. However, as of July 1, 1960, about 135,000 had taken advantage of the program. Collectively, this group had borrowed approximately $60 million.

If the current year follows the general pattern that has been established to date, I believe you'll find that there will be about 150,000 participating with funds totaling approximately $75 million for the current school year.

How can interested persons obtain additional information about the program?

The Department of Health, Education and Welfare publishes a small pamphlet which outlines the general provisions. This is available by writing directly to the Student Loan Section, Office of Education, Washington 25, D. C. However, I believe both parents and students would get much more satisfactory answers by contacting the school in which they are interested.

As pointed out, in reality, this program is 1,400 different programs, each peculiar to the participating institutions. Consequently, much more pertinent information is available directly from the college or university involved in the final transaction.

MEDICARE TODAY

A report on benefits available through the Dependents' Medical Care Program now starting its fifth year.

by Dave Karten, *Airman Staff*

JUST four years ago Congress passed the Dependents' Medical Care Act, a worldwide program to provide medical attention for dependents of active duty personnel.

Since the law became effective December 7, 1956, an average of more than 1,500 USAF dependents received medical care in civilian hospitals daily. Over a million Air Force dependent Medicare claims have been processed.

Dependents treated for ailments ranging from appendicitis to shingles couldn't be cared for in military hospitals because of a lack of adequate facilities, or the distance they lived from an air base. These Air Force families found in Medicare a dual blessing: assured medical help and monetary savings.

Although the law provides care for most illnesses requiring hospitalization, obstetrical (OB) and maternity services claimed major attention. More than 185,000 births to USAF dependents were recorded during the program's first four years. Considering that some 65,000 babies—one every eight minutes—were born in Air Force hospitals last year, this figure isn't difficult to understand. Under the provisions of Medicare, the government paid most of the bills. Since the program's beginning, this has totalled more than $100 million.

"From the number and nature of the inquiries we receive about Medicare," says Maj. Gen. O. K. Niess, Air Force Surgeon General, "it's apparent many of our people aren't familiar with the program's purpose or the benefits available to them. Some airmen have the mistaken impression the Air Force is obligated to provide complete medical care for dependents. Unfortunately, this is not the case.

"The USAF Medical Service's primary mission is to provide medical care for our military personnel. Eligible dependents of members and former members of the Air Force are authorized medical care of the highest quality and broadest scope in military hospitals within the limits of available staff, funds, and facilities. Where such care is not available, the hospital commander has no alternative other than to advise the dependent to seek the required care from civilian sources or to refer the patient to another uniformed services medical facility which has the required capability.

"Airmen should bear in mind that the military services are in no position to solve all the problems incident to the care of their dependents. In implementing Medicare we have the same restrictions other military organizations have in requesting funds, justifying them, and being guided in the program's operation by what funds are furnished. While Medicare may not be the final answer to dependent medical care, it has accomplished much in its first four years.

"Prior to enactment of the law there was no statutory authority whereby dependents of members or former members of the Air Force could be given medical care in either civilian or service medical facilities. Such care could only be provided on a 'policy' basis. Naturally, dependents fortunate enough to reside with their sponsors near the larger Air Force installations had fairly complete medical care available to them. But dependents residing near our smaller bases, or apart from their sponsors, were unable to obtain care in uniformed services medical facilities. It was to eliminate this disparity that the Medicare law was enacted."

Morale Factor

When the 84th Congress passed the Dependents' Medical Care Act (Public Law 569) as one of several career incentive legislative proposals, it was hailed as a "new era" in medical care. For the first time in the history of the military, dependents were given a statutory entitlement to medical care on a standard basis at Federal expense. It also marked the first time that care of Air Force dependents was recognized in its true importance.

Has the Dependents' Medical Care Program achieved the purpose for which it was intended?

The majority of the Air Force dependents who received care under the plan feel that it has. A master sergeant whose wife was treated in a civilian hospital after she was injured in an accident miles from an air base voiced the reaction of many: "Without Medicare," he said, "I don't know what we would have done."

The program got off to an auspicious start. It set an excellent record of assistance to dependents in 1957, but received a setback in October 1958. It was then that the principle of free choice was withdrawn for dependents living with their sponsors. There were two reasons for the curtailment of benefits: (1) service hospitals experienced a marked decrease in dependent admissions after Medicare got under way, and (2) the free choice system increased the cost of the civilian physician-hospital phase of the program to an excessively high level.

At the time there was no way of predicting just how these restrictions would work out since there are so many variables. There were, for instance, regional and local variations in the percentage of dependents separated from their sponsors. There was also a difference in military hospital capacity as well as in local distribution of the total pattern of requested care. And there were differences in the annual cycle of births, seasonal variations in requirements for care, and in local epidemics.

When all these variables had worked themselves out, it became evident that a substantial part of the reduction in scope of eligible care could be rescinded provided the permit system (DD Form 1251, "Nonavailability Statement," which must be obtained) remained to insure optimum utilization of service hospitals.

A comprehensive review of the Medicare program was made last year. After careful study of dependent medical care requirements, the permit system was retained and most of the deleted care was restored effective January 1, 1960.

Specifically the type of care restored includes:

Treatment of injuries on an outpatient basis.

Pre- and post-hospitalization tests and procedures required for the proper management of bodily injuries and surgical procedures for which a patient is hospitalized.

Acute emotional disorders constituting an emergency which is a threat to the life of the patient. Payment is authorized only until the disorder subsides, until arrangements are made for care at other than Medicare

expense, or until the end of 21 days of hospitalization, whichever occurs earliest. Exceptions authorizing the extension of this 21-day period may be granted by the Contracting Officer, Office of Dependents' Medical Care, only on an individual case basis—for example, where the sponsor is overseas and unable to make arrangements for care at other than Medicare expense.

Another may be for planned surgery, formerly not authorized under the restricted program. The repair of uncomplicated hernias, and many gynecological surgical procedures are restored to the program this year.

Who Can Get Medicare?

All military dependents who are spouses—wives (or dependent husbands of WAF)—and legitimate children are eligible for medical care from civilian sources under the program. Other eligible dependents, e.g. parents or parents-in-law, are authorized care in uniformed services medical facilities.

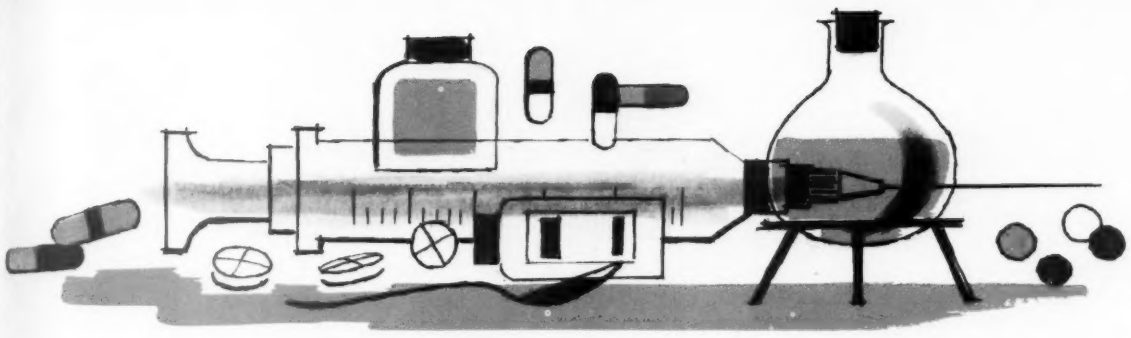
To be eligible for Medicare an Air Force dependent's sponsor must be on active duty (or active duty for training) for an indefinite period or for more than 30 days.

The dependent's eligibility for medical care from civilian sources ceases when the sponsor retires, dies, is discharged, divorced, or released from active duty. If the sponsor dies while on active duty, or while in a retired status, his dependents are still eligible for care at any Armed Forces or U. S. Public Health Service hospital when space and staff are available.

Under the Medicare program dependents are divided into two categories: those living with their sponsors, and those living apart from their sponsors.

How You Apply

First, dependents must have the DD Form 1173, "Uniformed Services Identification and Privilege Card." Dependents who live with their sponsors must first try to get care from Air Force (or any other service) facilities before using civilian facilities. They are required to determine whether the required medical care can be provided in a nearby service hospital. When such facil-



ities are not available, a Medicare Permit (DD Form 1251, "Nonavailability Statement") must be obtained in order to have the authorized medical care from civilian sources paid for by the government. If no military hospital is nearby, the form may be issued by the commander of the nearest uniformed service installation or off-base activity. Without such a permit, the government will pay for medical care from civilian sources only in the following cases:

In an acute emergency, such as a serious injury following an accident, or illness of a sudden onset requiring immediate attention.

When a dependent is away from the area of the sponsor's household on a trip.

During maternity care for an eligible dependent wife whose husband dies on active duty and who is pregnant at the time of his death.

Air Force dependents who live apart from their sponsors may choose between civilian or uniformed services medical facilities. In such cases, there is no requirement for a DD Form 1251.

Assuming then, that either your wife resides with you and has been given a DD Form 1251, or that she resides apart from you and elects to use civilian facilities, she must:

Make sure the doctor of choice is participating in the program and will accept her or your child as a Medicare patient.

Show the doctor the Identification and Privilege Card (DD Form 1173) that proves the dependent eligible for Medicare.

The doctor will make all arrangements for treatment.

These Are The Things Which Medicare Covers

Hospitalization in semiprivate accommodations up to 365 days for each admission. This includes all necessary services and supplies furnished by the hospital during hospitalization.

Complete obstetrical care including prenatal care, delivery and postnatal care in a hospital, office, or home. Necessary infant care is authorized during the period of hospitalization following delivery.

Injections administered by the physician are payable, provided such drugs are necessary and directly related to the condition for which authorized care and treatment is being given. Oral medications furnished during the outpatient phase of maternity care are not authorized at government expense. However drugs prescribed by the physician may be obtained from a uniformed services pharmacy if the items are available there.

Hospitalization for acute medical and surgical conditions, including flare-ups for chronic diseases, surgery for chronic or congenital conditions for improvement of function, and services required of a physician prior to and following hospitalization for a bodily injury or surgical operation. The dependent will normally pay charges for diagnostic tests or procedures in excess of $75 prior to hospitalization and in excess of $50 following hospitalization. The dependent will pay for all such tests prior to and following hospitalization for conditions other than bodily injury or a surgical operation.

Diagnostic tests and procedures including laboratory, pathology, and X-ray examinations when ordered by the attending physician, and when accomplished during the hospitalization of a dependent admitted for treatment of a condition or illness that qualifies as authorized care.

Treatment of fractures, dislocations, lacerations and other wounds when the patient is *not* hospitalized. The dependent will normally pay the first $15 of such physician fees.

Treatment in a hospital of acute emergencies of any nature which are a threat to the life, health, or well-being of the patient including acute emotional disorders.

Dental care which is a necessary adjunct to medical or surgical treatment rendered in a hospital to the dependent who is a hospital inpatient.

Charges Authorized Under Medicare

In a military hospital your dependent pays $1.75 a day. In a civilian hospital the cost is the same for a semiprivate room, or $25, whichever is greater. There are extra charges for private rooms.

Normally, general nursing care is part of the regular charge for civilian hospital care. However, if the attending physician certifies a private nurse is needed the dependent pays the first $100 and 25 percent of all charges over $100.

Things To Remember

There are several important things to remember about the Dependents' Medical Care Program. It does *not* provide for normal outpatient care by civilian doctors. Although injuries such as fractures and dislocations

can be treated by civilian doctors under the program, most outpatient care from civilian physicians isn't authorized. If your wife wants the civilian doctor to look into your son's throat, or give your daughter a penicillin shot, she—or you—must pay for it.

However, in certain cases involving bodily injuries, dependents may be treated on an outpatient basis. For cuts, bruises, sprains, fractures, and the like, the doctor can treat the patient in his office. He can, in fact, use a hospital facility such as the cast room, without the patient actually being hospitalized. In such cases, the dependent pays only the first $15 of the doctor's bill and will not be required to pay any hospital charges. In bodily injury cases the government will also pay for diagnostic and therapeutic tests and X-rays authorized by the attending physician.

If your son falls off his bike and breaks his arm, for example, or your dependents are injured in an accident, the law authorizes care by a civilian doctor. You'll have to pay the first $15 of his bill; the government pays the rest.

Military Care Authorized

Military care for dependents, authorized if the medical staff, space and facilities are available, includes a wide spectrum of medical care ranging from diagnosis to surgery, maternity to infant care. Dependent care not authorized in military hospitals includes treatment of chronic diseases, especially long-standing nervous and emotional disorders, cosmetic surgery, convalescent care, and procurement of prosthetic devices, such as glasses, dentures, and braces.

Since routine visits and treatments are excluded from the Medicare plan, outpatient care of dependents at Air Force hospitals during the past four years has continued at pre-Medicare level. The requirement for doctors in the Air Force is as great as ever.

Medicare for most dependents overseas is handled at military facilities. In localities where such care has not been available, area commanders have authorized treatment from civilian sources as provided by the law.

What's Ahead?

Can we expect further changes in the Medicare program?

Brig. Gen. Floyd L. Wergeland, Executive Director of the Office for Dependents' Medical Care says: "Recent changes in the program are not necessarily final. We have not made an unchangeable commitment to an unchangeable procedure. If Medicare doesn't work out as we hope it will, we may have to take more administrative actions to further improve the types of dependent medical care offered."

Although the number of men in the Air Force has decreased, the percentage of married men and number of dependents continues to increase every year; now numbers approximately 1,500,000.

The increase of the size of Air Force families in recent years makes it likely that the need for Medicare by USAF dependents will probably increase in the years ahead. In General Wergeland's opinion: "All the facts and figures we can point to indicate an increasing use of civilian physicians and hospitals in the future. Since the total requirement for care is relatively inflexible, the civilian care phase of the program, which supplements the care provided in our service hospitals, must inevitably grow."

High Professional Quality

Review of case after case indicates civilian care provided eligible USAF dependents since Medicare began has been of high professional quality. This impression has been confirmed by comments of the majority of dependents who respond to Medicare's continuing survey. Ninety-eight percent of those queried expressed satisfaction with the care they received from civilian sources under the program.

But Medicare officials aren't resting on their laurels. Periodically, representatives from all branches of the service meet to see how they can possibly improve the type and kind of service rendered. "We're planning ahead for our service personnel," says General Wergeland. "Our projections are tentative, but they're steps in the right direction."

What Medicine Will Do For You?

What Medicare Will Do For You

EMERGENCY CARE

1. When it is necessary for spouse or child residing with sponsor to obtain care from civilian sources due to a *bona fide* emergency (serious injury following an accident or illness of sudden onset requiring immediate treatment at the nearest available hospital to preserve life, health, or to prevent undue suffering). In such cases the attending physician is required to certify that the emergency did, in fact, exist.

2. When hospital care is required during a period of absence from the area of the sponsor's household on a trip. This exception is not to be used to circumvent the requirement for obtaining a "Nonavailability Statement."

For dependents residing apart from sponsor, provisions of par. 1 will apply.

OUTPATIENT CARE

1. Treatment for bodily injuries (fractures, dislocations, lacerations, and other wounds) is authorized. Treatment includes diagnostic and therapeutic tests and procedures authorized by the attending physician including consultant's services. Treatment of fractures, dislocations, lacerations, and other wounds customarily cared for by a dentist is also authorized.

2. Patient pays first $15 of physician's charges for *each* different cause or accident for which treatment and services are rendered. Multiple injuries to the same person resulting from a single accident are considered as one injury for the $15 payment. The government pays all costs in excess of the $15 for care of injury. However, payment by the government for laboratory tests, pathology and radiology examinations may not exceed a $75 maximum.

These provisions apply to dependents living with or apart from sponsors.

MATERNITY AND POSTNATAL CARE

The dependent residing with sponsor must utilize armed services medical facilities unless prohibited from doing so because of distance or transportation difficulties. When professional or medical facility capabilities are inadequate the dependent must obtain a "Nonavailability Statement" to allow care at Medicare expense.

Post-natal visits to examine newborn are not allowable.

Necessary infant care may be provided on an outpatient basis in the case of home or office deliveries during a period not to exceed 10 days following the date of delivery.

When a change of physician is made because of a change of station or other reasons, maternity patients will be required to clear with the nearest uniformed services or station to determine whether care is available there. If not, a new "Nonavailability Statement" will be issued.

A dependent living apart from sponsor has free choice between civilian and armed services physicians and medical facilities. A "Nonavailability Statement" is not required.

Postnatal visits to examine newborn are not allowable.

Necessary infant care may be provided on an outpatient basis in the case of home or office deliveries during a period not to exceed 10 days following the date of delivery.

When a change of physician is made because of a move without joining the sponsor, a "Nonavailability Statement" is not required for continuation of Medicare. When sponsor is joined, maternity patients will be required to apply at the nearest uniformed services base or station to determine whether care is available there. If not, a "Nonavailability Statement" will be issued.

MEDICAL AND SURGICAL CARE

1. Medicare does not authorize medical or surgical care desired or requested by the patient which in the opinion of the cognizant medical authority is not medically indicated. Examples of types of care not authorized are: cosmetic surgery; congenital defects; sterilization procedures; and removal of tattoos. However, treatment for surgical conditions that are not classified as acute but for which good medical practice dictates prompt attention are authorized, i. e., tonsillectomies. Treatment of non-acute surgical conditions will be authorized only if certain conditions prevail, i. e., ears: surgery for restoration or improvement of hearing (not for psychological or cosmetic reasons); Rhinoplastics: authorized only for improvement of nasal respiratory physiology (not for psychological or cosmetic reasons).

2. Up to $75 is allowed for prehospitalization diagnostic tests and procedures in conjunction with the same bodily injury or surgical procedure for which hospitalized.

3. Up to $50 is allowed for posthospitalization diagnostic tests and procedures in conjunction with the same bodily injury or surgical procedure for which hospitalized.

The above provisions apply to dependents residing with, or apart from, sponsors.

When sponsor joins (to reside with) hospitalized dependent, the dependent may complete treatment under Medicare. This also includes readmissions, the direct result of complication for this condition.

EMOTIONAL DISORDERS

1. Care for acute emotional disorders is authorized if such disorder is considered to constitute an emergency which is a threat to life or health of the patient. Care will be provided under Medicare for an acute disorder only until the disorder subsides until arrangements are made for care elsewhere, or until the end of 21 days' hospitalization, whichever occurs earliest.

2. Medicare will authorize hospitalization for acute emotional disorders when the patient is hospitalized for a condition that qualifies as authorized care. (Example: Emotional disorder while hospitalized for fractured leg.)

3. Acute disorders complicating pregnancy or constituting postpartum psychosis occurring within a six-week postpartum period are authorized.

The above provisions apply to dependents residing with or apart from sponsor.

DENTAL CARE

Generally, the government will not pay for civilian dental care. Dental treatment is provided only to hospital inpatients who are hospitalized for otherwise authorized care, as a necessary part of the treatment of the basic medical or surgical condition requiring their hospitalization.

HOSPITAL CHARGES

A service dependent in a civilian hospital will pay $1.75 a day, or the first $25.00 of the hospital cost, whichever is greater.

ADDITIONAL CHARGES

PRIVATE HOSPITAL ROOM

The above charge, plus

1. Twenty-five percent of the difference between the cost of the private room and a semiprivate room, *if the attending physician certifies a private room is needed.*

2. The difference in cost of the private room and a semi-private room, *if the private room is for the dependent's convenience.*

PRIVATE-DUTY NURSING CARE

The first $100 of the cost and 25 percent of the charges over $100 *when the attending physician certifies that this care is needed.*

READMISSION TO HOSPITALS

1. Except in obstetrical and maternity cases patients readmitted to a civilian hospital within 14 days after discharge, due to an acute complication of the condition for which they were originally hospitalized pay $1.75 per day *if they can prove they paid at least $25 for the previous admission.*

2. All admissions of obstetrical and maternity cases during and directly related to the same pregnancy are considered as one admission.

DEPENDENT STATUS

Lawful wife, lawful husband (if dependent on service wife for over one half of his support).

Unmarried legitimate child, adopted child, or stepchild:

1. Under age 21.

2. Over 21, but incapable of self support because of mental or physical incapacity that existed prior to age 21.

3. Under 23, enrolled in a full-time course is an approved institution of higher learning and dependent on service member for over one half of support.

To guarantee America that it can strike back,
SAC adds more insurance with its . . .

AIRBORNE COMMAND POST

by SSgt. Charles Meredith, Hq SAC

Photos by SMSgt. William E. Lummus

"WE DON'T KNOW when we'll be going," said the colonel as I introduced myself, "so just take a seat and watch television while you're waiting."

As he returned to reading a file marked TOP SECRET, I gingerly sat down at a multibuttoned console and turned my attention to a color TV set in an adjoining booth.

"And over here near Guam," said the announcer, "these B-47s are airborne after RON at Andersen from a REFLEX . . ."

As I watched the vividly colored maps, tapes, lines, routes, and numbers flash on and off the screen, the announcer—a major, and three other officers gave a complete, classified analysis of the Strategic Air Command's "fighting configuration" for 0830 hours on the 19th of July, 1960.

The briefing, which covered every facet of SAC activity, was a worldwide report on aircraft, operations, materiel, communications, and weather.

"On alert this morning," said the last briefing officer, "are bombers and missiles. That concludes the briefing, sir. Are there any questions?"

If there were, they would come from Gen. Thomas S. Power, SAC Commander in Chief, or one of the other general officers assigned to the headquarters.

I was sitting in SAC's famous underground command post, and the briefing, a twice-daily event, was being carried over closed circuit TV to the offices of General Power and his battle staff.

From my vantage point in the control room, I watched the images on the screen as well as the action in the huge, glassed-off amphitheater from which the officers and the TV cameras were originating the program.

To my left was the famous Red Telephone, and surrounding me were communication consoles—porcupined with buttons, radio sets, electronic equipment, dials, switches, booths, desks, and armed men.

Facing into the room were four ceiling-mounted TV sets, three of which were carrying closed-circuit data. The first, originating from Weather Central within the building, gave the weather picture for the U. S.; the second, originating from NORAD (North American Air Defense Command in Colorado), displayed a plotting map showing the location, speed, and heading of "unknowns" near the North American Continent; the third monitored the entranceway to the underground.

The fourth set, tuned to a local station in nearby Omaha, was carrying an early morning news report.

Each piece of equipment in this room—the finest thus far devised, and each of the airmen using it—all hand-picked from throughout the Air Force, were here for one reason: to control and direct SAC's global armada of bombers and missiles.

The key to such an undertaking is communications—instantaneous and positive. In this room is the equipment that will allow the command to contact any agency, commander, base, country, or SAC bomber, anywhere in the world—immediately.

But at the moment, I wasn't interested in what made

the underground "tick." This, within the bounds of security, had been thoroughly explained in the hundreds of stories and photos about SAC published throughout the world—including Moscow.

What would happen, though, if this room, with all its men and equipment, were to become inoperative?

Who would control the bombers? And how?

I would soon know. Lt. Col. Wesley G. Kille, (still reading his TOP SECRET file), had arranged for me to take part in an operational "scramble" of the Strategic Air Command's Airborne Command Post, a specially equipped KC-135 jet tanker.

The Airborne Command Post, announced only two months earlier by General Power, was now operational.

Each day a KC-135 crew of the 4321st Strategic Wing's 34th ARS, assigned to Offutt AFB, and a team from SAC's Directorate of Operations, are on "alert," ready to scramble instantly.

To keep the system efficient, the teams are exercised at least twice a week on a no-notice basis, at which time they are joined by a general officer. Once in the air, they remain on a pre-determined route (within a specified radius of SAC Headquaters), and are capable of assuming control of the command.

At some unknown time this morning the word to "go" would be received, and men from this room would leap to a crucial and vital mission.

In the meantime, for Colonel Kille, who is chief of the Control Branch, and the other personnel, it was business as usual. Buttons continued to blink on the consoles, messages came and went through the pneumatic tubes, phones and buzzers added to the din of conversations, TV images changed from charts to numbers to people, then back again, and time passed.

"Here we go," said Colonel Kille. "Just follow me." I hadn't even noticed him answering the phone.

Men who just the minute before had been reading books and marking charts now had their hats on, and—brief cases in hand—were out the door.

The time was 0856.

The pace was deceptive. Nobody ran, but still—within seconds—the group maneuvered through a labyrinth of stairs and halls, past badge-scanning guards, to the headquarters entrance.

The guard at the front door, recognizing the approaching group, made a slight motion with his hand. In response, two staff cars pulled up in the driveway. Six doors opened to swallow the group, and before they closed, the two cars moved off as one.

Again the pace was deceptive but certain. Swinging past the parking lot to the north of the building, the cars turned right and, gaining speed, raced toward the runway.

Already the deep-throated roar of jet engines swelled through the air.

As the cars entered the flight line, armed guards stepped to the windows, checked badges, and waved the group on toward the KC-135.

Conversation, which had been nil during the entire trip, would have been impossible by now. As the cars drew up to the sleek jet tanker, the screaming crescendo of its four engines beat painfully on the eardrums, made one's skin twitch, and vibrated the concrete ramp.

The time was 0858.

Hats in hand, the group dodged around the deadly intakes and boarded the plane through its nose hatch. Last to enter, I was almost at the ladder top when two pairs of arms reached down and lifted me into the plane. Looking back at the ground, I was stunned to see it moving. The plane was already in motion. MSgt. Lyle E. Rundell, the boom operator, closed the hatch.

The plane moved off the ramp, onto the taxi strip, and out to the runway. It turned, paused, and once again began screaming. Tables, straps, seats—everything—shook and rattled. I had barely sat down and strapped myself in before the plane jumped forward.

The time was 0901.

The operations staff already seated at their places, were twisting dials and throwing switches.

The landscape moved past the window . . . first slowly, then quickly, then as a blur. The world became

Teams are exercised at least twice a week on a no-notice basis to insure complete readiness and peak efficiency in event of a genuine emergency.

Operations staff in airborne command p can communicate with SAC bombers and combat operations cente around the world.

a vortex of screaming engines and vibrating metal. Then, much like a diver on a board, the plane dipped, resounded from a loud "clack," and leaped.

The time was 0904. We were airborne.

As the plane continued its steep ascent, I looked around me. The jet tanker had been modified only slightly to permit its new and important command function. Just aft of the crew compartment was a walled-off padded area containing two tables used by the operations staff. This was the command post. Otherwise, the plane was the same as any other KC-135; bucket seats, wooden floor, and—in the extreme rear—the boom operator's well.

The tanker could just as well be hauling fuel for an in-air hookup, personnel to a forward area, or cargo between bases.

The roar diminished, and the plane leveled off. The time was 0906.

Sergeant Rundell walked back to where I was sitting, put his mouth to my ear and shouted, "How's it going?"

"OK!" I answered. "By the way, what was that 'clack'?"

"That was our landing gear. When the plane's nose lifts, it stays extended until we break ground, then it comes up."

"You sure didn't waste any time getting ready to take off," I said.

He nodded and replied "We got the 'go' word the same time you did."

Then, like two old men—deaf from age—we continued to alternately shout into each other's ear while the other sat, head bowed, listening.

"What are they doing now?" I asked, pointing toward the compartment.

"Well, see those two airmen up front? They're the radio operators."

The two airmen, dressed in flight suits, were sitting side by side before a radio set. Mostly, they just sat and stared, listening to the voices in their earphones. Occasionally, one would press his earphones closer to his head, reach up to twist a dial, write something on a pad, and then resume his staring.

"The others make up the operations team, and they're the ones doing the actual talking. That's General Blanchard (Maj. Gen. William H. Blanchard, SAC's Director of Operations), he's in charge; then there's Col. Leslie J. Westberg, for this flight he is Senior Controller; and the others are TSgt. Karl L. Hoff, TSgt. Robert Zeleniack, Capt. George Brown, Maj. Branson Wood, and Colonel Kille . . . you've met him."

The group, most of whom were sitting at the larger table, watched as Captain Brown manipulated switches on another radio set mounted over their table. All were wearing earphones. Sergeants Hoff and Zelenjack, straying no farther than their cords would permit, moved about to transfer notes, mark charts, or extract operations orders from the brief cases.

"Who are they talking to now?" I inquired.

Rundell smiled and shrugged his shoulders. "Name it," he said. "Spain, Guam, Puerto Rico, England, Chennault (AFB, La.), Washington (D. C.), NORAD, anybody. They have a checklist, and go right down it from top to bottom."

"How can they hear with all this racket?" I asked.

Again he smiled. "Don't worry . . . they can hear fine. Besides, they've already arranged to have that compartment soundproofed."

"What are my chances of listening in on the conversation?"

"You can, if you want," Rundell said. "But it won't make much sense. It's all coded."

Following him back into the compartment, I waited while he talked to one of the radio operators, who listened, nodded, and handed me his earphones. Rundell was right. It didn't make sense, at least not to me.

Although this was a practice mission, the plane would be launched at the first sign of an emergency. The tanker, and the men from "Ops" had all been ready to go.

If at this very minute it became necessary for the plane to take over the key functions of the underground command post, it could do it.

I looked back into the compartment. The group was still occupied with dials, switches, note-writing, brief cases, earphones, and checklists. Only Colonel Westberg was talking. His lips moved, but the noise drowned out his words.

As I watched, I tried to imagine what difference, if any, there would be if this were the real thing. Working from a quickly conjured checklist, I began to check off items: uniforms?—the same; airplane?—probably the same one, although I knew there were stand-by aircraft; additional supplies?—they wouldn't have stopped for any—time wouldn't permit it; equipment?—the same; altitude? speed? heading?—probably all the same.

Would the difference be in the men themselves? I looked again, but more carefully, at General Blanchard, Colonel Westberg, Colonel Kille, and the others. Momentarily their expressions were nonplussed, but then Sergeant Hoff said something, probably a punch-line and several of the group smiled.

"The smiles," I said to myself, "are about all that would change."

As the plane winged on toward what would become a five-hour flight, I opened my notebook and started to write.

Back in the underground command post, the morning briefing had ended, and the cameras had been rolled away, but officers and airmen continued to post figures and routes on the huge wall charts. Console buttons flashed on and off, phones rang, people moved about, and the four TV sets were still going.

On the first was a steady projection of weather data, occasionally a hand would appear to change a number, then disappear. On the second was a map of North America, marked with numbers and arrows. Above the room's din a voice from that set was announcing a new "unknown," just off Alaska. On the third was a steady, clear picture of a doorway. Occasionally a person would appear on the screen, then disappear, only to reappear—in person—within the control room; on the last set, the local station in nearby Omaha was making a news report:

"Today in the U. N.," the announcer said, "the Soviet Union warned the United States that . . ."

The time was 0911.

Every day a KC-135 crew is on "alert," ready to take to the air with SAC's command operations team.

For a group of part-time airmen it was a good summer's work in any Air Force book.

by
Capt. Ted R. Sturm
(USAF, Ret.)

THEY CIRCLED THE GLOBE

AT THE point of no return, number one engine backfired, missed, then backfired again. The reports cracked through the sun-warmed C-119 over the Atlantic like exploding antiaircraft shells.

Suddenly each throb of the engines, each whistle of the wind, each shudder of the box-like fuselage was magnified a thousandfold as the crew of part-time professional airmen snapped into action. Sergeant Beauchamp appeared like a genie from the rear. His trained eyes gulped in the entire instrument panel at a glance.

The pilots raced through the checks they had practiced thousands of times before. RPM on number one was down twenty. Something to watch; nothing to worry about. Everything else was normal.

Both engines now droned healthily, indifferent to the brief furor number one's impolite burping had caused. As *Wilma India Four* droned on into the morning sun, the Atlantic assumed a more ominous appearance than before. It stretched endlessly toward the hazily defined horizon, beyond which lay the gray Azores.

The aircraft was one of eleven C-119s that only yesterday had shattered the damp, still air blanketing Langley AFB, Va. At 15-minute intervals in the predawn hours of July 1, 1960, the "Boxcars" had raced down the runway, labored into the air, and thundered into the northeast.

By nightfall they were to skirt the Gulf of St. Lawrence, circle over Newfoundland's St. Georges Bay, and squat for the night on the broad ramps of Ernest Harmon AFB. This was the first leg of a journey that would end at Agra, India.

The flight was unprecedented. These were not Regular Air Force crews to whom global missions were a routine occurrence. Manning the eleven aircraft were 55 members of the USAF Reserve—men who only days before held civilian jobs as varied as the areas from which they came.

In total, 21 aircraft made the trip in two separate flights. The first group had departed several days earlier. The mission was the delivery of the Fairchild "Flying Boxcars" to the Indian Air Force. They had been sold to the Indian government by the U. S. For the first time in history, Reserve crews were used on an overseas aircraft ferrying mission by the Air Force. How did the crews feel about it?

"It was actually just a routine mission," said Capt. Norman Reid, a senior pilot of the 73rd Troop Carrier Squadron at Scott AFB, Ill., "even though it was longer than any we had made in the reserve forces be-

fore. I don't mean that it was dull, by any means, but that everything went as planned."

Bad Weather

After a moment's thought he recalled the termination of the first leg of the flight in Newfoundland. "I suppose that if our crew were superstitious, they may have had cause for concern. The unpredictable weather over the Maritime Provinces might have been taken as a bad omen. Then again later when that engine acted up. As it turned out, the weather simply fouled up the plans for staying at Ernest Harmon AFB."

Only two of the eleven landed there. Four were diverted to Moncton in Nova Scotia, and five landed at Gander, Newfoundland's main municipal airport. Reid's aircraft was part of this group.

At Gander, they had a slight delay getting a small part for a distributer. But on the morning of July 2, all aircraft departed on schedule for the long, lonely leg to Lajes, in the Azores.

Because of the 15-minute flight separation, each crew operated as an individual flight. This put them strictly on their own, and across the Atlantic each faced its own moment of truth. For most, it was the first transoceanic flight. (Others, during tours of active duty, had made the flight before.)

Reid's crew was a typical group. The aircraft commander was Capt. Othur E. Garrett, described by the crewmembers as "a gentleman farmer from Paducah." Captain Garrett has 260 acres of land that occupies a lot of his time, but never seems to cut into his Reserve activities.

Captain Reid was the pilot. In civilian life he is a member of the staff at Grinnell College in Iowa. The navigator—a man upon whom much attention was focused as the C-119 nosed out over the Atlantic—is an employee of the St. Louis, Mo., Office of the Aeronautical Chart and Information Service. He had been assigned to MATS during his last tour of active duty, and was familiar with the route.

SSgt. William Beauchamp, from East St. Louis, was the flight engineer and SSgt. Edward D. Hudspeth, from St. Louis, was the radio operator. Both NCOs are Air Reserve Technicians—that new breed of airmen who are civil service employees, working full time in military slots with Reserve units. The ARTs have actual Air Force rank, to be assumed in time of general mobilization.

Beyond the Gray Azores

As *Wilma India Four* droned into the morning sun, Newfoundland's rocky coastline glinted briefly and was swallowed up in the mist. The Atlantic, sparkling brilliantly 11,000 feet below, winked teasingly with pinpricks of light as the sun's rays were picked up by heaving swells. As the Grand Banks slipped behind, the sea became darker. Until the engine played its little prank, the crew had begun to settle into the relaxed atmosphere so typical of long flights. But when the engine coughed, it shattered the relaxed mood like an unexpected visit by the Chief of Staff.

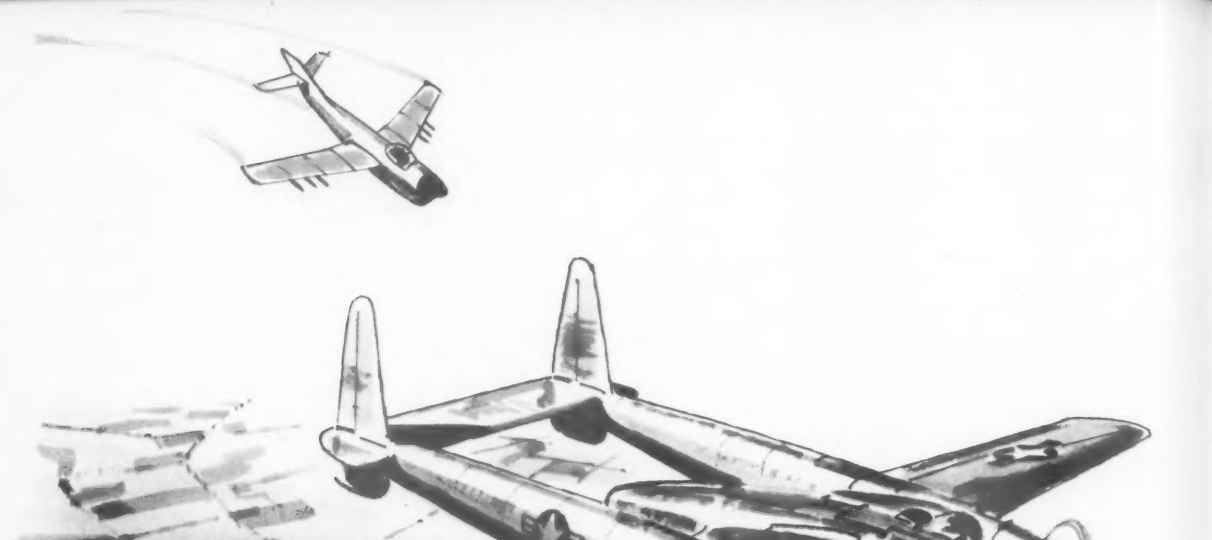
"Make no mistake," Reid said. "It made us nervous for a few minutes, but although the RPM remained low everything else was normal. We decided that the instrument wasn't working right and we settled back, relieved but not completely relaxed."

As the afternoon grew old Lieutenant Bonham made a quick check of his calculations and ordered a slight course correction. "Lajes should be popping up any time now," he announced. As though they were waiting for such an introduction, the Azores appeared as a purple blur dead ahead on the horizon.

Although less than half the distance to Agra had been covered, there wasn't a man among the eleven crews who didn't feel that they had made it. After two nights at Lajes while maintenance crews corrected minor ailments of the C-119s, the flight departed for France. *Wilma India Four's* tachometer still registered 20 RPM low, but Beauchamp and the Lajes mechanics could find no other malfunction.

During the next five days the journey was similar to a tourist-class Mediterranean vacation. The airmen flew over the lush fields of southern France, skinned the shinbone of Italy, scraped the edge of Corsica, wished for a lower altitude over the sun bathers of Capri, and rested at Cyprus.

On the morning of the 11th the flight left the resort climates behind. Ahead were 1,500 desolate miles of



the Middle East's deserts, and Dhahran, their next stop. Here tension mounted.

The men of *Wilma India Four* were painfully aware of the fact that a swept-wing jet fighter of unknown origin had swung in behind one of the aircraft of the first group several days before. The jet pilot had asked for the aircraft's number, scrutinized the C-119 suspiciously for several minutes, and then flashed off to somewhere.

Into the Dust

Reid confirmed the fact that every man on his crew suffered from eyestrain as they scanned the torrid horizon, but they saw nothing. As they neared Dhahran their vision was even more restricted by great billowing clouds of dust that rose to 11,000 feet, obliterating the sands below—if, in fact, as Reid wondered, there *was* any sand left on the surface below. The airplane climbed to 13,500 feet to avoid the dust which seemed to grow thicker with each mile. As they entered Dhahran's approach control zone, they were told that visibility on the ground was a mile and a half, the minimum for the base. They prepared for a GCA landing.

Descending into the clouds of dust, guided by the calm voice of the controller, they banked into their final turn. As they touched the sun-baked landing strip, Garrett muttered that "anybody who can see a mile and a half in that dust has better eyes than I."

The crew disembarked, drenched in perspiration, the hot ramp burning through the soles of their shoes. The day before, ramp temperature had registered 168 degrees—a common occurrence in these parts, and so hot that refueling operations were conducted at night. The ground crews could climb on aircraft wings without getting a king-sized hot foot.

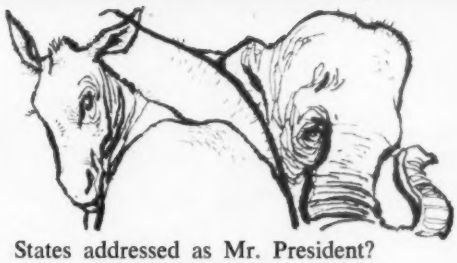
On the morning of July 12th, Captain Reid decided to wash a few clothes before they departed on the final leg of the journey. He rinsed some sport shirts and hung them out to dry. Before he got them all up, the blazing sun had dried the first ones.

"I was amazed," he said. "It hadn't been more than five minutes since I hung the first shirts and they were ready to take down."

The same day, 9 hours and 15 minutes after leaving Dhahran, *Wilma India Four* touched down at Agra and an unprecedented reception by representatives of the Indian government and its air force.

It was July 12th. The mission was completed without incident; a glowing testimony to the "ready now" concept under which the Air Reserve forces operate. For the crews, it was a memorable experience. They boarded a MATS aircraft for the flight home via the Pacific. When they landed they had completed a historic flight around the world. They would have much to tell the folks at home.

LOOKING BACKWARD



Now that the fuss, feathers, and frenzied furor of the national elections have faded from the forefront of public attention, it is interesting to look backward at some of the political Americana recalled to memory by the recent campaign.

Have you ever wondered why the Solid South is called solid, man? For many years after the Civil War, former slaveholding states voted the straight Democratic party ticket. This solid front was achieved in 1877 after the withdrawal of Federal occupation troops and overthrow of the Republican party's domination. First crack in southern solidarity appeared in 1928 when a number of southern states supported Herbert Hoover, the Republican candidate for President.

Who were the "Know-Nothings" in American political history?

In 1852 a secret organization was formed for the purpose of restricting immigration and limiting the participation by foreign-born persons in government. Many of the rank-and-file members of the movement were poorly informed on the program of the party, and answered "I know nothing" when questioned. The party came to be known as the "Know-Nothing" party. In 1856 it abandoned its secrecy and adopted the name American party. In 1860 it became extinct.

Ever heard of a Mugwump?

It is surprising that this colorful fragment of political vocabulary has not been revived. The Mugwumps were Republicans who bolted the party after the nomination of James G. Blaine for President in 1884. Senator Carl Schurz was leader of the Mugwumps. In the flowery campaign oratory of the period one definition of the Mugwump ran: "a person whose ability was less than his pretensions." Another: "a person educated beyond his intellect." Probably the most colorful definition deriving from political fence-straddling was: "a person who sits on a fence with his mug on one side and his wump on the other."

Do you know how the donkey and the elephant came to be adopted as symbols of the Democratic and Republican parties?

The donkey was first, being portrayed in a cartoon by Thomas Nast in Harper's Magazine of January 15, 1870. In the original cartoon, the "copperhead press" in the form of a live jackass was shown kicking a "dead lion," representing Edwin M. Stanton, recently deceased Republican Secretary of War. Later Nast began using the donkey as the symbol for the whole Democratic party.

Nast also originated the elephant as the symbol for the GOP, four years after the donkey. His first use of the elephant was in a critical sense as he thought the party had grown unwieldy and timid.

Modern Democrats regard the donkey as a symbol of homey, down-to-earth appeal, and Republicans regard the elephant as a symbol of intelligence and impressive strength.

Where did we get the expression "red tape?"

This was borrowed from the British. As part of the cumbersome routine of conducting the public business, it was customary to tie packets of papers with red ribbon, which constantly had to be untied and retied as files accumulated. Thomas Carlyle's frequent references to red tape in his critical essays gave widespread currency to the term.

Repeated reference is made to "inalienable" and "unalienable" rights. Which is correct?

In Jefferson's original copy of the Declaration of Independence, "inalienable" appears. After the Declaration was adopted by the Congress alterations were made, one of the changes being "unalienable" for "inalienable."

Why is the President of the United States addressed as Mr. President?

One of the earliest Congressional debates dealt with the title of the chief executive. A Senate Committee recommended that the President be addressed as "His Highness, the President of the United States of America, and Protector of their Liberties." In the House, James Madison pointed out that the Constitution explicitly prescribed the title as "President of the United States of America." Thus the President is distinguished by having no title. A governor is addressed as "Your Excellency," and a judge as "Your Honor," but the chief executive is simply Mr. President.

Who made the remark: "What this country needs is a good five-cent cigar"?

Vice President Thomas Marshall of the Wilson Administration.

Politicians have not always been held in the high esteem they enjoy today. Here is how Walt Whitman described those gathered for a typical National Convention in the pre-Civil War era.

"The members who composed it were, seven-eighths of them, the meanest kind of bawling and blowing office-holders, office-seekers, pimps, malignants, conspirators, murderers, fancy-men, custom-house clerks, contractors, kept-editors, spaniels well train'd to carry and fetch, jobbers, disunionists, terrorists, mail-riflers, slave-catchers, pushers of slavery, creatures of the President, creatures of would-be Presidents, spies, bribers, compromisers, lobbyers, sponges, ruin'd sports, expell'd gamblers, policy-backers, monte-dealers, duellists, carriers of concealed weapons, deaf men, pimpled men, scarr'd inside with vile disease, gaudy outside with gold chains made from the people's money and harlots' money twisted together; crawling serpentine men, the lousy combinings and born freedom-sellers of the earth."

—JOHN K. O'DOHERTY

perils & plights of pilots

The Case of the Hypoxic Corpse

Shortly after the U. S. declared war on Germany in World War I, the medics began experimenting to learn how the lack of oxygen affected aviators. An incident that occurred abroad underscored the importance of the experiments.

Lieutenant M. was undergoing flight training at Po, Italy. In carrying out his altitude test flight, the instructor noted that as the pilot reached an elevation over 10,000 feet, his head fell over the side of the fuselage as in a faint.

The stick and wire flying machine went into a spin and fell to the ground. When the rescue party reached the wreck, the pilot was seemingly dead. There was a fracture of the frontal bone and a piece of bone over the frontal sinus was driven into the brain. The body was placed in the morgue.

That evening the morgue keeper's curiosity got the better of him. In order to see how deep the wound was, he pushed his finger down into it. Whereupon Lieutenant M. sat up and swore at him. The terrified keeper rushed from the morgue. A medical officer took the supposed corpse to the hospital and removed the pieces of bone from the brain. The pilot made a complete recovery.

Those Were the Days

Barnstormers of the post-World War I era were a breed of fliers now almost extinct. They scorned regulations and some were killed because of it. They would be briefly toasted in the Quiet Birdman's Club in New York, and their beer mugs put on the "permanently dead" end of the shelf to catch cobwebs along with the mugs of other barnstormers who had died.

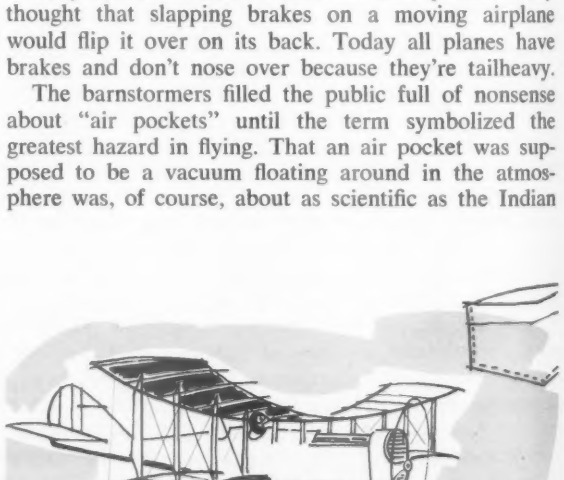
They flew planes that had only tachometers, oil-pressure gauges, and altimeters, and sometimes not even those. They regarded the compass as an ornament. They flew by river, road, or railway. If the steel beams had been taken up during that period, many of our most famous pilots might never have lasted to follow a radio beam. They flew "by the seat of their pants." Now and then, when times got lean and breeches threadbare, they flew by closer contact than that.

They contributed much to the future of aviation. Traveling from state to state and from county to county, they demonstrated to millions of Americans who never before had seen a plane that mechanical flight was a reality. Many a skeptic witnessing a "flying circus" said with a shake of his head, "If I didn't see it, I wouldn't believe it!"

The barnstormers also had their superstitions. Casey Jones, who won many of the air races in the halcyon days of aviation, would never go up without his old threadbare green flying jacket. Clyde Pangborn felt lost without his chamois vest.

They landed without brakes on their planes. They thought that slapping brakes on a moving airplane would flip it over on its back. Today all planes have brakes and don't nose over because they're tailheavy.

The barnstormers filled the public full of nonsense about "air pockets" until the term symbolized the greatest hazard in flying. That an air pocket was supposed to be a vacuum floating around in the atmosphere was, of course, about as scientific as the Indian



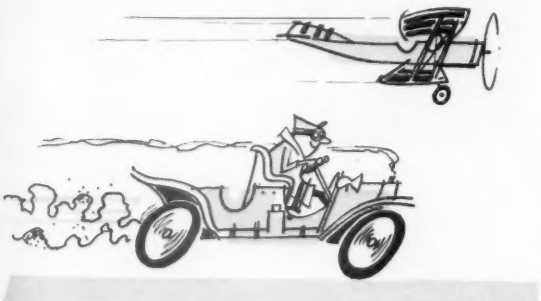
rope trick. Most mishaps were directly or indirectly attributed to "air pockets." It was the easiest way to explain, or rather avoid explaining, the cause of some silly accident.

Today's counterparts of airpockets are the gremlins. They are the little devils that drink the gasoline, stick their fingers into the carburetor jets, cover the wings with ice, bounce up and down on the engines, play teeter-totter on the gyro horizon, use the compass card as a carousel when the pilot is flying on instruments, push the radio beam from side to side, fry eggs on the transmitters, bang on the telephones with a sledge hammer, pick the currents off the radio antennas and perform a million other deviltries to annoy pilots. The barnstormer's "air pocket" took care of everything.

But for all their primitive knowledge and primitive equipment, the barnstormers had one thing in common—they loved to fly. Not long ago one of the old barnstormers was interviewed on television. He was asked what he thought of today's jet pilots. "Jet pilots don't fly," he replied, "they sit in front of a blowtorch and hope for the best."

The Fledgling Flights

The fledging "aeroplane," as it was called in the early days of flying, tried its wings in exploits that became progressively more and more daring. There was, for instance, the time Lincoln Beachley, a noted flier in those days, raced his plane against an automobile.



And there was the experience of Lt. H. H. Arnold (who later became Chief of Staff of the AAF during WW II). In 1911 Lt. "Hap" Arnold flew a Wright biplane at a Long Island air meet in which the United States Army participated.

In those days an officer participating in an air meet had to pay all expenses from his personal funds. At the end of the meet young Lieutenant Arnold was flat broke, without enough money to pay his railroad fare back to New York, to say nothing of his hotel bill. A friend, also financially flat, came to his rescue. Moving among the spectators, he announced barker style that the Army flier had consented to fly passengers for a modest fee. A wealthy sportsman was the first to accept the offer. The young lieutenant and his passenger had been in the air but a few minutes when a sudden rain squall buffeted the little plane. Lieutenant Arnold's skill, only lately acquired, plus a dash of good luck

enabled him to make a safe landing and to roll the plane under its own power into the primitive hangar. The passenger who had agreed to pay fifty dollars for the ride, handed the pilot a hundred dollar bill. Embarrassed, the young flier said he could not make change. "Never mind," replied the passenger, glad no doubt that he was still alive, "some other time will do." Then he hurried away.

Many years later, when stars had replaced the bar on his shoulder, General "Hap" Arnold met his passenger of long ago at a social function and gladly returned the fifty dollars change.

Lighter Side of the Lift

The Berlin Airlift is remembered as a milestone in aviation. It demonstrated the potentialities of the airplane in the field of freight transport. But it got off to a rugged start.

During its hectic first six weeks, pilots flew *Operation Vittles* in rain, mist and freezing cold. They logged flying hours beyond human endurance; nicknamed the venture "Operation Nightmare."

But strenuous as the work was, there were lighter moments when the iron discipline became frayed at the edges. As the operation was accelerated weary, sleep-starved airmen filled the ether with jibes and gripes until interrupted by "Tower to all aircraft. Maintain radio silence please. Must contact other aircraft arriving."

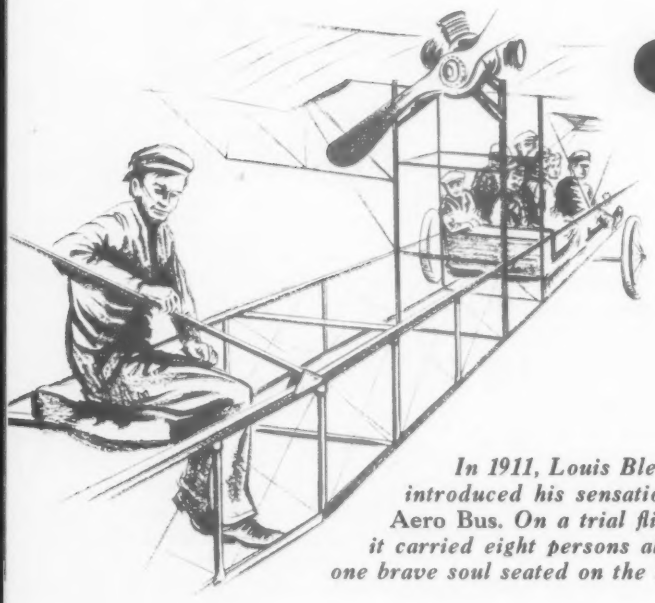
Even the tower had its off moments, as evidenced by the experience of one eager young pilot. When he was ready to enter the pattern he called the tower for instructions. The reply was garbled. It sounded like Russian. So he kept repeating his call over and over: "Tower from Big Will 405. You are coming in garbled. Please repeat!"

But the jabberwocky from the tower continued. His insistent requests to repeat brought no improvement. Finally a new voice came on loud and clear. The operator gave him final instructions and apologized for the poor reception with an explanation. "You were speaking with Sergeant Jensen," he said. "He had just lost the upper plate of his false teeth in a sneeze and could not talk. Sorry!"

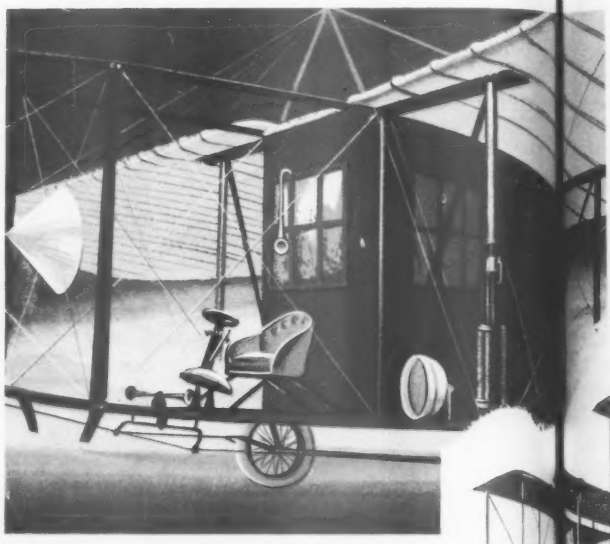
—DAVE KARTEN

ODDITIES of early vi

Illustrations by Maj. Robert J. Flanagan.

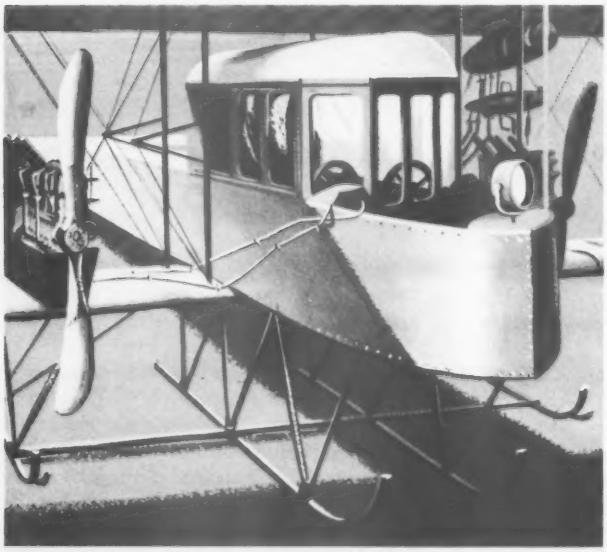


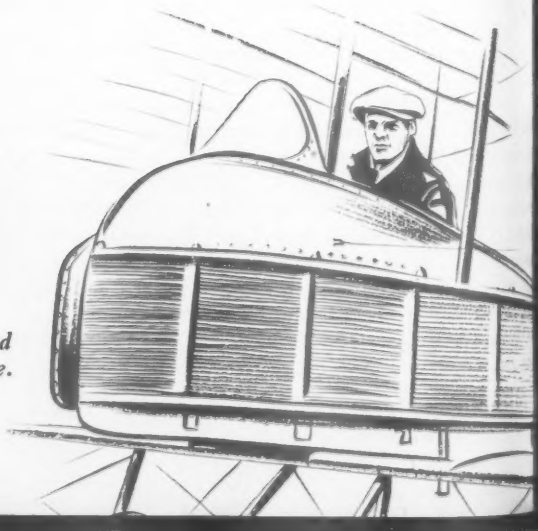
In 1911, Louis Bleriot introduced his sensational Aero Bus. *On a trial flight, it carried eight persons aloft, one brave soul seated on the tail.*



The Aero Taxi *which was displayed in 1911 during a French exposition did, indeed, bear resemblance to the familiar taxicabs seen on streets of Paris.*

World's first four-engine plane was designed in 1912 by Igor Sikorsky in Russia. It was called the Grand, *and looked rather like a cross between a trolley, a boat, and a sled.*



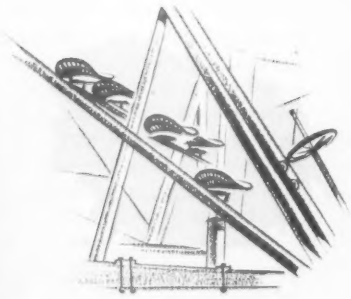


This early English model had water-cooled engine. Radiator surrounded the fuselage.

viation

In the earliest days of airpower history designers of flying machines first explored a number of blind alleys before settling on a true course of orderly progress. Many of the pioneer machines appear incredibly fantastic by modern standards.

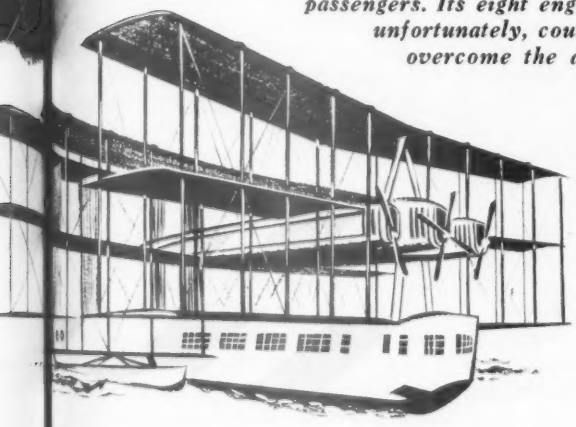
The process of trial and error was just as valid and necessary in those times as it is today. Sophisticated missiles now in the hands of Air Force units were developed only after an agonizing period of exploration and testing.

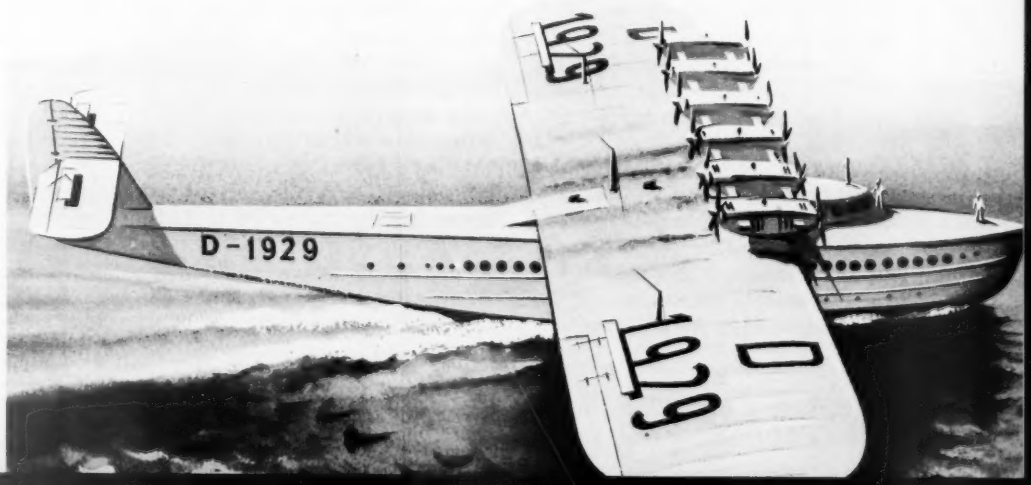


Some designers used plow seats, placing low priority on comfort.

In 1914, French government offered 50,000 fr. for development of stable aircraft. Prize went to Sperry of U. S. who flew "no hands" over Paris while companion walked on wing.

This 1919 Italian design featured nine wings. Flying boats got a big play from pioneer designers. The multi-tiered ship weighed 30,000 lbs., and had seats for 100 passengers. Its eight engines, unfortunately, couldn't overcome the drag.





e DO-X introduced by rmany in 1929 looked t ocean liner with ngs. On nonstop flight m U. S. to Europe, the ly loaded ship barely off the water and eight hours could gain altitude higher n 50 feet above sea.

SLANTS ON SPACE

". . . and on Earth, Peace . . ."

During the Christmas season, these long familiar few words will be repeated in hymns and carols; they will recur once more in uncounted sermons and invocations; they will be inevitably found again many times in print and elsewhere.

After another extremely tortuous, peril-ridden year, the four words are becoming—in the voiced opinion of so many—something equivalent to a short, simple prayer which embodies the most fervent hopes of most of mankind, regardless of creed or persuasion, for the lightening of the now still dubious days ahead.

If anyone is uncertain where these words originated, they come from the account of St. Luke, the evangelist, of events attending the birth of the Christ. He is describing the angelic choir which hailed the Child's coming by hymning Glory to God and adding the appeal for ". . . and on Earth, Peace . . ." (Luke 2:14).

At various times in the past THE AIRMAN has dwelt on how some other members of the Solar System acquired their present names, as well as any significance or verbal evolution which may have been involved in the process. Hence, obvious relevance attaches to a query about how the Earth likewise came by its distinctive name, and an earnest effort will be made to supply what tangled information appears available on the topic, plus such clues as may shed fitful light on the word's odd evolution.

There can be no question but that the name of the Earth is overdue for its share of scrutiny. The Space Age moves along in its fourth year, but we know this challenging and adventurous era not because of what reaches of Space are measured from sister planets, their satellites, the asteroids or remote stars. It is Space measured from where we are and stand on *terra firma*. Our planet, the Earth, is after all the deciding point of reference.

The word, "earth," on its way to inclusion in the English language, is generally conceded to be of Teutonic origin—although there are a few obscure suggestions its formation in Germanic dialects may have been a little influenced by the sound of terms for the same thing in earlier tongues. It will be understandable that the word had become part of the vocabulary of the ancient Saxons, a Germanic people, who with the Angles, also of Germanic stock, began to infiltrate Britain in 500 A.D.

The transitions in spelling the word underwent in our parent language are on the perplexing side, to say the least. Of the very old, rare manuscripts in which it happens to appear (however the component letters are assembled), few now known predate the 11th century and still survive. Some hint of the changing ways it was put together may be found in the multi-column Oxford Unabridged Dictionary, which devotes—in small type—several tight columns to the word and its gradual changes in subtle shades of meaning. This reference work lists more than 20 spelling variants for the first several centuries of preserved documents.

To cite some of these variants for anyone interested, they include: eorde, eorou, eroee, horde, ere, irthe, urth, yerth, erith, yirth, orth, erd, eard, eirth, eird, yird, yeard, eard, and several more.

In one of the earliest English manuscripts still extant, believed to have been written about 1000 A.D., the word is rendered eordan. One of the gospels, translated in 1160, has "se (sea) and eordan." Another manuscript of religious character, surviving since approximately 1300, uses a form recognizable by ear, at least, in the passage: "de watris He calid de se, de drey he calid erd."

As for meaning, the word referred for centuries almost exclusively to the ground or soil to be tilled for food, and only after that a place of abode, then to land in the sense we think of some stretch of terrain today. The other early definition, apparently in common use, had to do with the earth as the accepted burial place for the dead. There were probably some written exceptions, since lost, to this general usage, for in a copy of the early classic, *Beowulf*, *eordan* is employed to distinguish the countryside from the heavens. This was about the year 1175.

Of course, astronomical studies were primitive down through these dim centuries and there are no extant records to enlighten us on what variety of spelling star gazers preferred. However, at approximately 1400 (or some two centuries before the telescope's invention) the old word expands greatly to include the whole world then known, for in a surviving manuscript we can read about the "Erthe, that Betwixt is sett The sonne and hir (moon)."

Experts in the world of words consider this quoted passage as the first in recorded English which may be taken as defining the earth as a planet. The words appear in a translation of the celebrated and lengthy poem, *The Romance of the Rose*, published in Paris decades earlier.

It is not until a couple of centuries later that the present day spelling of the word begins to recur with increasing frequency. An edition of the *Book of Common Prayer*, dated 1549, contains the line: "O let the Earth, speak good of the Lord," and a translation of the Bible, attributed to the year 1611, notes: "The whole earth was of one language" (Genesis 11:1.)

In secular literature, meanwhile, we have Will Shakespeare writing in 1601: "You should not rest between the elements of ayre and

earth." (*Twelfth Night,* I: V, 294.) Later in this century the orthodox spelling appears in such passages of John Milton's celebrated *Paradise Lost* as: "O Earth! how like to heav'n, if not prefer'd more justly," and "The seat of men, Earth, with her nether Ocean circumfus'd," among others.

And so what is now accepted as the correct combination of letters for the name of our native planet at long last became finalized, to coin a new verb form. No other member of the solar system ever went through the bewildering spelling maze our planet followed before its existing name was firmly established —certainly not in the English language, anyhow.

So ". . . and on earth, Peace . . ." That quotation, incidentally, comes to us from an early translation of the New Testament into Latin which reads: *". . . et in terra, Pax . . ."* The words have the same meaning and in the same order as their English equivalent just cited. The reader will detect nothing in the Latin version remotely suggesting in spelling the name of our planet, although readers may detect in the Latin word for "earth" (terra) the parent of such English terms as terrain, terrestrial, etc.

But, as historians tell us, the New Testament was originally set down in classical Greek, still a universal language in the Mediterranean basin at the start of the early Christian era. In this original version, the brief passage reads like this (and again the words are in the exact order as in English):

". . . Καὶ ἐπὶ γῆς εἰρηνή . . ." Rendered phonetically in English, this would sound something like "ky (rhyme with sky) epi gees (gays) irena." Again no suspicion of any letter combination to suggest the English spelling for earth, although the amateur word sleuth may detect in "gees" (Greek for earth) the source of the prefix we use in such words as geography, geology, geodesy and so forth.

So in the three languages the word order is the same, the meaning of the words, and the prayerful sum total of their common message: ". . . and on Earth, Peace . . ."*

One last tentative word may be in order for the sake of thoroughness; the old Greeks had a spare word for earth, ἐ α (era) which also had more frequent usage with additional syllables containing letters which might be rendered into English with a "d" or "t" sound.

As for "era," its influence on the later formation of the Latin *terra* is recognized. Glance back and note how in the very early spellings in English, the combination "er" (something like its equivalent) predominate in the first syllables and a variation of "d" or "t" sound recurs so often in the second syllable. Perhaps the bygone Greeks weren't too far from a word akin to "earth"—a not too rash speculation. They seem to have had a word for about everything else, including the atom—ατομος

Be that as it may, there is nothing to ban a repetition of ". . . and on earth, Peace. . ." plus a joyous and serene Merry Christmas to all fellow denizens of the planet, Earth, be it in the fourth year of the Space Age or not.

Editor's Note: The word-sleuths had a difficult time tracing down how we came by the word, earth. As pointed out in the August 1960 issue of THE AIRMAN (page 11) they are still at a loss in their efforts to find the ultimate origin of another familiar word commonly used as a synonym for space, i.e., the heavens.

*D*uring 1960 it is estimated that the 250-foot radio telescope at Jodrell Bank, England, devoted approximately 10 percent of its operational time to tracking and monitoring space vehicles, as well as relaying commands in some instances. The other 90 percent of its time has been split between investigating unidentified radio emission sources in the universe and radio studies of several galaxies located at no great astronomical distances from the Milky Way, the galaxy which contains the Sun, Earth, and other planets.

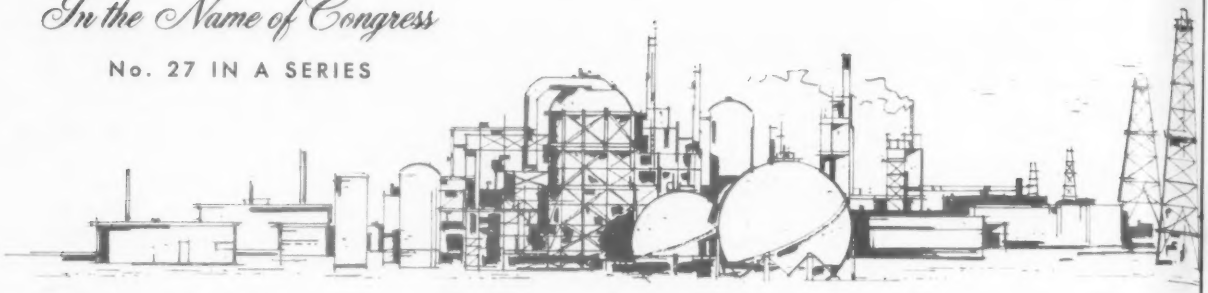
In operations connected with man's space experiments, the longest was spread over the 106 consecutive days that Jodrell Bank's big dish monitored signals from the *Pioneer V* space probe until that vehicle became inaudible after traveling 22,462,740 miles from Earth. In its study of celestial radio sources this U. K. observatory has been ranging out much farther; it picked up one such source whose distance from our planet is calculated at 36 million million billion miles (or six billion light years). This radio source was receding from our galaxy at about half the speed of light which has a velocity of roughly 186,300 miles per second.

*H*as cloud-shrouded Venus a phantom satellite? Reports that a mystery planet might exist go back at least as far as 1645. Reputed sightings of such a moon have occurred at widely separated intervals since, some by past astronomers of good general reputation. Equally able men, however, failed later to locate it. Reports on sightings of the Venus moon became suspect when serious discrepancies developed as to the relative size of the reputed phantom satellite when compared to that of its planet. The last alleged sighting was in 1764, prior to the discovery of the planet, Uranus. Astronomers of the past century, with increasingly improved instruments at their command, believe that bygone observers mistook for a satellite a star which happened to be in a misleading position with relation to Venus for a time or possibly an alignment with then undiscovered Uranus. As one modern authority comments, satellites do not "softly and silently vanish away."

—WILLIAM A. KINNEY

In the Name of Congress

No. 27 IN A SERIES



While the oil offensive concentrated on crude oil and refineries, synthetic plants were also subjected to a share of attacks in the

CONTINUING OIL OFFENSIVE

by SMSgt. Hal Bamford

DETERMINATION, as exemplified by the act which culminated in his death, characterized the entire military career of Lt. Robert Edward Femoyer.

Born in Huntington, W. Va., Bob Femoyer was just 12 days past his 21st birthday when he enlisted in the Reserve Corps of the Army Air Forces on November 11, 1942.

The following February he was called to active duty and assigned to a basic training center at Miami Beach, Fla. Late the following month, he was transferred to the University of Pittsburgh to begin aircrew training.

His chosen path ran comparatively smooth throughout the early months of his new life, but in November 1943 he was relieved from further pilot training at the primary school in Jackson, Miss., and recommended for reclassification because of a flying deficiency.

Several months of anxious waiting followed, but his determination to earn a commission and wings compelled him, shortly after he completed flexible gunnery school with high honors, to apply again for aviation cadets. Finally, in February 1944, he received word that his efforts had paid off.

On June 10, the same year, his long-sought goal of wings and bars was realized when he graduated from the Army Air Force Navigation School, Selman Field, La., and was awarded his second lieutenancy.

The following months were packed with additional training in the specialties of aerial combat, and on September 20, 1944, Lt. Robert E. Femoyer reported to the 711th Bombardment Squadron, 447th Bomb Group at its base in England.

As a replacement navigator he began his combat career within weeks and by the first of November was awarded his first major decoration—the Air Medal, for five combat missions.

Lieutenant Femoyer would never remember the following day but many others would recall his heroic role in the action that occurred.

Long before Bob Femoyer arrived in England to make his magnificent contribution to the Allied aerial effort, the Combined Bomber Command had launched its famed oil offensive which was to drain the life blood from the Axis war machine.

In the early months of 1944, oil had become the principal target of strategic warfare. Most of the crude oil fields and plants, such as those surrounding Ploesti, had long been high on the list of Allied targets, but it was not until the last few months before invasion that the rain of destruction against Germany's synthetic plants began to increase.

The Germans, banking on the superiority of their air force, had grouped the majority of these plants in a relatively confined area near the city of Leipzig, southwest of Berlin. From April, this area was to be the repeated target for Allied long-range B-17s and 24s.

While the offensive scored repeated hits, and damage continued to be heavy, the synthetic plants also managed to continue production, at least on a limited scale. Consequently, these targets retained their high priority on the Allied lists. It was on a return visit to one of these that Lt. Bob Femoyer was to fly the day after he received his Air Medal.

On the morning of November 2, 1944, Lieutenant Femoyer's unit was among those selected to bomb the complex at Merseburg-Luena, a scant 15 miles from the heart of Leipzig.

While the German Air Force had been reduced to a position of relative inactivity by fighter and bomber attacks, there were still times when they could be counted upon to provide major opposition. For example, it was on a raid of this type—July 28, against this same Merseburg complex—that the *Luftwaffe* had introduced the world's first combat jet fighters.

Additionally, the decreased German aerial efficiency had forced them to increased antiaircraft protection, and the well-flown route was strewn with plentiful and accurate batteries.

After leaving England, the bombers experienced

relatively little opposition until they had penetrated well into the heartland of Germany. However, as they settled into the final run, German antiaircraft fire swelled in volume. Here and there, the U. S. bombers began to drop out of tight formations. Among those which were seriously crippled was that on which Lieutenant Femoyer served as navigator.

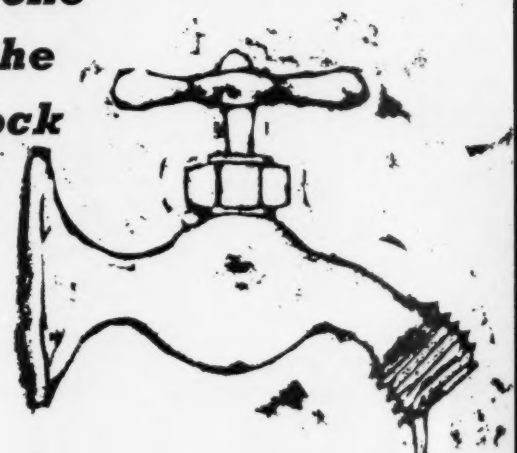
The citation which accompanied his posthumous Medal of Honor dramatically describes the ensuing action.

For conspicuous gallantry and intrepidity at the risk of his life above and beyond the call of duty near Merseburg, Germany, on 2 November 1944. While on a mission, the bomber, of which Lieutenant Femoyer was the navigator, was struck by three antiaircarft shells. The plane suffered serious damage and Lieutenant Femoyer was severely wounded in the side and back by shell fragments which penetrated his body. In spite of extreme pain and great loss of blood he refused an offered injection of morphine. He was determined to keep his mental faculties clear in order that he might direct his plane out of danger and so save his comrades. Not being able to rise from the floor, he asked to be propped up in order to enable him to see his charts and instruments. He successfully directed the navigation of his lone bomber for two and one-half hours so well it avoided enemy damage. Only when the plane had arrived in the safe area over the English Channel did he feel that he had accomplished his objective; then, and only then, he permitted an injection of a sedative. He died shortly after being removed from the plane. The heroism and self-sacrifice of Lieutenant Femoyer are in keeping with the highest traditions of the United States Army Air Forces.

Lieutenant Femover's Medal of Honor was awarded posthumously on May 9, 1945. It marked the 36th in Air Force history and the 31st of World War II.

Lt. Robert Edward Femoyer

Someone Left the Petcock Open



During the month of November 1944, 8th Air Force formations repeatedly dropped totals of bombs which soared past the 1,000-ton mark in the oil offensive, including 1,400 tons in the November 2 mission against Merseburg-Luena.

Their efforts, which had forced the initial leak in the supply line, now resulted in unleashing a flood, seriously lowering POL production and supply stocks. By the close of November, Germany's total oil production was down to about 30 percent of the capacity of the previous spring. Additionally, every synthetic plant, except those at Merseburg-Luena and Politz, was reported as completely out of action. These two were reduced to "partial operation and limited capacity."

Since the beginning of the designated oil offensive, the combined U. S.-British units had dropped a total of more than 94,000 tons of bombs on selected refineries—both crude and synthetic—throughout Germany proper. Allied planners claimed destruction far beyond what had been expected, and the entire German war machine began sputtering to a tank-dry stop because of their efforts.

Postwar examination of the cogent facts proved the effectiveness of the campaign. As early as midsummer, during the battle for Caen, Germans were forced to employ their tanks as stationary forts. Later in the summer, they abandoned nearly all types of vehicles that could not be horse-drawn, fleeing on foot across France. Even *Luftwaffe* training was reduced to a few ineffective weeks.

In short, the very life blood of modern warfare—oil—was no longer available to the Axis in quantity. The result was an increased pace of the strangulation of a dying nation, and airpower had once again proved its right to equality in modern war planning.

recognition is due the men, military or civilian, who designed this satellite and the very complex systems that enabled it to follow instructions. Without these complex communication, computation and ejection systems that functioned so well, none of the goals of the *Discoverer* program would have been achieved. I think they deserve credit at least equal to that of the crew.

Name Withheld

★ ★ ★

Letters Answer Letters

Sir: In your *Letters to the Editor* column in September, I was surprised by the letter which you published from A2C Paul Stern. He said that his study of Greenland had proven that it was greener than the British Isles, and that the author of the *Air Force's Polar Push* (May '60, THE AIRMAN) was mistaken. I have just about completed my tour up here and I have yet to see the green Airman Stern mentioned. I feel your author was pretty accurate with his article.

A2C Alton Womack
APO, New York, N. Y.

★ ★ ★

Officer Reactions

Sir: After 16 months in uniform, I have come to the conclusion that the Air Force is never going to give me an opportunity to utilize my potential abilities which are reflected by the B.S. degree I hold in aeronautical engineering. Consequently, the "challenging career" you have painted in *Why Our Young Officers Are Staying In* (Sept. '60, THE AIRMAN) certainly doesn't apply to me. I, for one, will

not be among the stay-in statistics you cite in future articles of this type.

Lt. Guntis Purins
Homestead AFB, Fla.

Sir: To dispel the idea that I'm just another disgruntled junior officer sounding off before I leave the service, let me hasten to say I have chosen USAF as a career. Still, I feel I should comment on the eulogistic dissertation contained in your September article. I can't argue with the percentages you quoted, but some of the reasons cited for staying in may not tell the true story. Let's face it—once you pass the five-year mark, it takes a lot of courage to get out and start over again.

Name Withheld

Sir: While my decision to remain with the Air Force obviously puts me in the category of "satisfied" officers, I take exception to the manner in which a career was presented in your September article. Someone has to do the "housekeeping" as well as the glamour jobs. No road to success is smooth, civilian or military. I think the picture was too flowery. Now, let's have an article entitled *Why Our Young Officers Are Getting Out.*

Name Withheld

★ ★ ★

In Error . . .

Sir: On page 4 of your September issue, the artist has made a glaring error. Both the rubber stamp and the resultant marks are facing in the same direction. The image on the stamp should have been reversed.

A2C Bennie Reid
Andrews AFB, D. C.

Sir: I have found a minor error in Sergeant Bamford's otherwise excellent article *Death at Pontoise* (Sept '60, THE AIRMAN). While it is true that the installation which serves as home for USAFE headquarters is named for the hero described in your story, I think you will find that it is Lindsey Air Station, rather than air base. Despite this, please accept my thanks for your excellent magazine which is top notch for both interest and information.

A2C Robert E. Rueter
APO 633, New York, N. Y.

Sir: In your August issue, in *Airman's World,* your article on Pepperrell contains a slight error. The 64th Air Division was relocated (not deactivated) to Stewart AFB, N. Y. While I am pointing this out, however, I should like to add my congratulations on your excellent publication. It is one of the best sources of information available to Air Force personnel.

A1C Donald Vallero
Stewart AFB, N. Y.

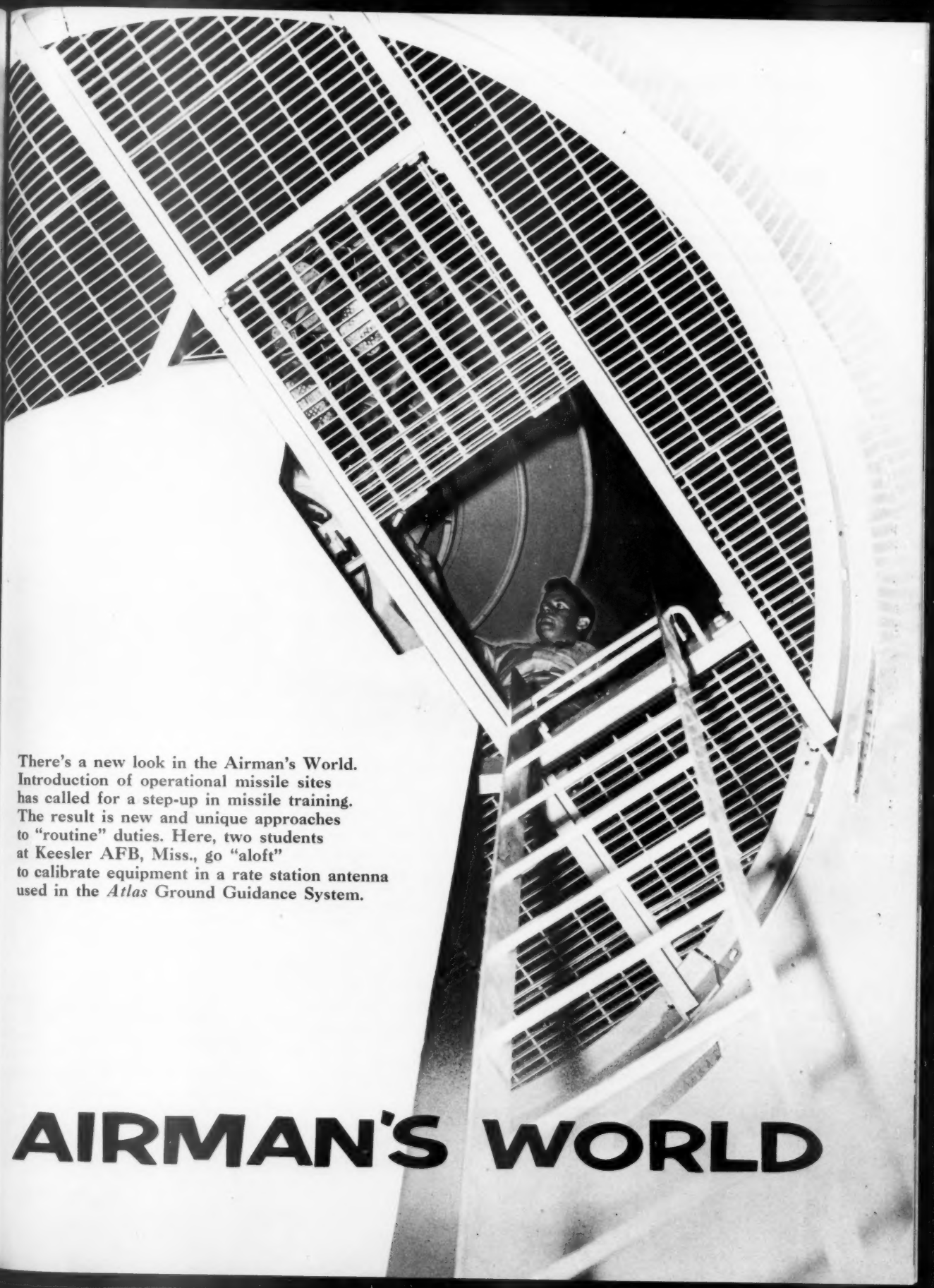
★ ★ ★

And No Error

Sir: I noted in your *Command Post* article in September that the photos showed several people wearing restricted area badges. Isn't there some restriction with regard to publishing such photos?

A2C David Cudd
Albuquerque, N. Mex.

• *According to officials in the Office of the Provost Marshal, such photos are not classified. However, prudence and good judgment must dictate the use of such reproductions. We think, if you study the pictures closely, you'll find that precautions were taken to assure that the badges were not clear enough to allow reproduction or counterfeiting.*



There's a new look in the Airman's World. Introduction of operational missile sites has called for a step-up in missile training. The result is new and unique approaches to "routine" duties. Here, two students at Keesler AFB, Miss., go "aloft" to calibrate equipment in a rate station antenna used in the *Atlas* Ground Guidance System.

AIRMAN'S WORLD

MACH 1 ENGINE CHANGE

In this modern Air Force, speed-of-sound operation is not confined to aerial events. This fact was proven without question recently at Beale AFB, Calif.

During a refueling mission, Lt. Col. Ralph E. Moore reported, "Explosion in number four engine," from his airborne KC-135. "No fire warning lights . . . am continuing mission," he concluded.

The message, however, set Beale's efficient maintenance machinery in motion. By the time Colonel Moore had completed his mission, brought his KC-135 into Beale and parked it, the gears were meshing smoothly. A ground crew was standing by in the parking area, replacement engine ready.

An inspector immediately went to work. Examination revealed that the explosion had occurred in the number seven compressor stage. Complete engine change was the only answer.

Without hesitation, the crew, under SMSgt. Chester Lee, leaped to their task. As the minutes began ticking away, arrangements were made to replace the KC-135 on its turn-around mission scheduled only a few hours later the same day.

However, almost before the substitution could be alerted, Sergeant Lee was reporting completion of the emergency project. Only 1 hour and 40 minutes after the crippled tanker had landed, it was reported back in commission and ready to complete its mission.

BITS OF BLUE

. . . Eielson AFB, Alaska, succeeded Ladd AFB in October as APOE for the Alaska area as a prelude to the closing of the latter next month. All airlift requirements to the area will be altered during the current month because of the change. The Army will assume jurisdiction of Ladd next month.

. . . Also scheduled to close this month is the Mallory Air Force Specialized Depot in Memphis, Tenn. The base was named for Maj. William N. Mallory, a Memphis native, who lost his life during WW II.

. . . The Secretary of Defense has approved and released more than $13 million for modernization of airmen dormitories at ATC, TAC, and SAC bases. However, the directive stipulated that these funds shall not be expended for "add-ons" or bid supplements.

. . . Also in the area of housing, officials in DOD have allocated and released nearly $1.5 million for rehabilitation and improvement of the 500-unit Wherry project at Connally AFB, Tex.

. . . ARDC officials have announced the award of two contracts for research studies of nuclear rocket propulsions systems. The $500,000 contracts went to Aerojet-General Corp. and Thiokol Chemical Corp.

. . . Three more USAF bases have been granted allocations for rehabilitation and improvement in Wherry projects. Total to be expended at Castle, March and McClellan AFBs, Calif., is approximately $3.4 million.

. . . Through the end of August, major aircraft accidents showed a 39 percent reduction over the corresponding 1959 period. Fatalities and aircraft destruction through accident showed equally significant drops.

. . . By paraphrasing a well-known newspaper's slogan, editors of the *Pinetree Lines*, 913th AC&W Squad-

ron monthly publication, have adapted it for their own use. "All the news is print to fit."

...USAF officials recently approved a third *Bomarc-B* site. Although no completion date was established, Niagara Falls Municipal Airport, N. Y., will eventually house 20 IM-99B launchers.

CONTRAILS TO GO

ARDC engineers have learned how to eliminate contrails. These bright plumes that give away an airplane's position are caused by water droplets in the engine exhaust. By reducing the size of the droplets, contrails are avoided without loss of engine power.

CONSOLIDATED PILOT TRAINING

USAF's new consolidated pilot training program, which will bring all phases of this training under "one roof," starts this month. Officials predict increased efficiency at less cost.

Fewer student moves and maintenance of a greatly reduced number of bases are expected to lower training costs. At the same time, significantly fewer student eliminations are expected as a result of continuous student supervision by a single administration.

Under the new program, USAF will operate only six cadet flying training bases, each offering all phases—pre-flight, primary, and basic. The six bases are Craig AFB, Ala., Williams AFB, Ariz., Moody AFB, Ga., Webb and Reese AFBs, Tex., and Vance AFB, Okla.

Several contract flying schools will begin closing this month as a result of the consolidation move. These include Moore AB, Tex., Bainbridge and Spence ABs, Ga., and Graham and Bartow ABs, Fla. Malden AB, Mo., ceased operations in mid-'60, and Laredo AFB, Tex., will pursue its present basic pilot training school mission only through early '61. Utilization of this base after that period is still under study.

BREATHING AID DESIGNED

SSgt. R. O. Gable, an Air Force medic, has devised an intermittent pressure-breathing apparatus which will answer field problems. Aimed at treating chronic lung disease patients, the new unit answers needs at field hospitals where more expensive equipment is not authorized.

The Webb AFB, Tex., sergeant's design is relatively simple and economical, utilizing equipment already available in almost any USAF personnel equipment shop. Needed are an oxygen regulator and mask, a 30-inch oxygen hose assembly and constant flow regulator, nebulizer and glass atomizer tube. These are connected by means of regular rubber and metal tubings, couplings, nozzles and brackets.

The aid can be assembled at a cost of approximately $130, far less than the $300 to $700 for standard equipment. The borrowed equipment may be reused in its normal function.

A NEW TWO-COMPONENT disposable pod for USAF's B-58 *Hustler* is now in production by Convair. Its use will provide added speed and range for the Mach 2 SAC bomber. The pod's lower portion carries added fuel and can be dropped when emptied, thus improving performance on the way to the target. The upper portion contains the payload and can be disposed of in the target area.

ARCTIC RESCUE

An 11-year-old Eskimo child probably owes his life to USAF's good neighbor policy.

Shot in the chest in a hunting accident, word of the child's critical condition was forwarded to Thule AB, Greenland. There the commander contacted officials of the 61st Troop Carrier Squadron at Sondrestrom.

A ski-equipped C-130 was dispatched with medical officers and emergency equipment. Within hours, they had flown to Resolute, 400 miles north of Thule, picked up the patient, and returned to the SAC base. Further medical treatment was administered and the patient hospitalized. The youngster, now out of danger, is expected to return to his home soon.

BATTERY INVENTION

USAF Maj. Harold H. Sperber has been issued a patent for his revolutionary improvement in wet-cell storage batteries.

Flying Safety Officer at the Air Force Flight Test Center, Edwards AFB, Calif., the major has been working on his invention for nearly 10 years.

Basically, the idea consists of an improvement in battery acid (electrolyte). In present batteries, action of this fluid causes a deposit to build up on battery plates. Eventually, this destroys the battery's ability to hold a charge.

Major Sperber's experiments have resulted in perfecting a new chemical compound. Added to the fluid, it blends with the sulphuric acid and water, forming an improved electrolyte. This acid materially reduces formation of battery-destroying deposits and offers extended life. Some of the batteries with which the major has experimented are still operating after eight years. No basic change in the battery is necessary.

Major Sperber was assisted by USAF officials in testing and patenting procedures, and the service will receive military rights to his invention.

NEW BOOST FOR BOMBERS

ARDC researchers have uncovered an important new power supplement for use on SAC's bombers. Best part of the discovery lies in the fact the supplement is a part of normal armament.

Tests conducted at Edwards AFB, Calif., have revealed that air-to-surface guided missiles can be used as "extra engines" when needed. Recent experiments with *Hound Dog* missiles "substantially reduced" *Stratofortress* takeoff runs.

Doubly important is the fact that such use does not impair the range of the missile. Once takeoff has been completed, the missile's fuel tanks are simply refueled from the bomber's supply.

The announcement means that SAC's giants may now operate from airfields with runways previously considered too short.

"He's here again, sir! Yeah, full of promises but no back dues."

SHAGGY BEAR STORY

Most people know that alcohol and driving don't mix. Now Capt. Roderick H. Drews, Utopia Creek, Alaska, thinks that this sage expression should include bears.

Captain Drews, Indian Mountain Aircraft Control and Warning Station Supply Officer, recently came face-to-face with a seven-foot-tall black bear standing behind the bar in the Officers' Club at the site.

The bear was calmly eating chocolate bars and washing them down with "swigs" of alcohol, and not the rubbing kind either.

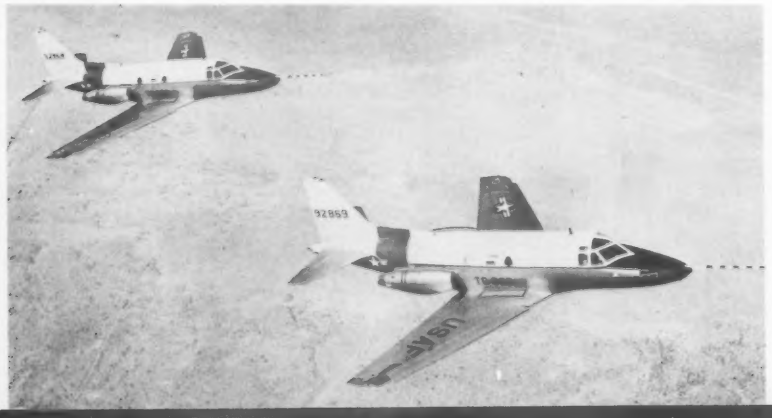
Not caring to be disturbed as he ate his repast, the bear slashed out a paw at the startled Captain Drews, narrowly missing the rapidly ducking head.

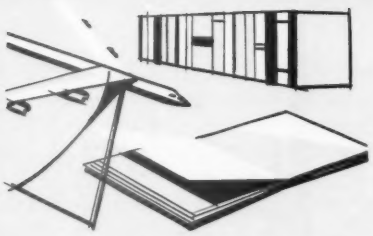
Responding to the captain's hue and cry, other squadron members joined in the task of "de-bearing the bar."

Damage to the club furniture and furnishings was extensive. Officials attributed this to the fact that this particular "self-appointed member" had not been briefed on squadron policy concerning good housekeeping practices. And Captain Drews, at that time was not favorably disposed at reading them aloud and obtaining the bear's initials.

The Airman

USAF OFFICIALS, impressed by recent T-39 *Sabreliner* tests, have ordered an additional 52 production models. Designed to cruise at 500 m.p.h. with a range of 1,720 miles on internal fuel, the T-39 topped both of these goals in its latest tests. A production model flew an 1,820-mile course at 540 m.p.h. Orders now total 94 aircraft.





Air Age Library

PROFESSIONAL READING

The Library of Congress has just released a revised edition of *Aviation Cartography* by Walter W. Ristow; $1.75. It is a historic-bibliographic study of aeronautical charts.

USAF personnel should also have a special interest in the *Handbook of Geophysics,* (Macmillan, $15.00). Prepared by 60 civilian scientists, it provides an excellent reference for this specialized field.

McGraw-Hill is the publisher of a *Handbook of Public Relations,* edited by Howard Stephenson; $12.50. It is a compilation of works by many experts.

SPACE

Space Biology, by James S. Hanrahan and David Bushnell, is a new Basic Books, Inc. release. Available for $6.00, it provides a comprehensive study of a comparatively new science in our changing world.

Clive E. Davis recently completed *Man and Space,* issued by Dodd, Mead; $2.75. It summarizes man's present knowledge of space and the research and development preliminary to space flight.

Nine Planets, Dr. Alan E. Nourse, (Harper, $5.95) tells the story of the physical nature of the planets, their satellites, and the sun.

HISTORICAL

Quentin Reynolds in *Known But to God,* tells the fictional and factual story of the unknown Americans who rest in Arlington National Cemetery. Released by the John Day Co., Inc. ($3.95).

The story of the dropping of the initial A-bomb on Hiroshima, *No High Ground,* by Fletcher Knebel and Charles Bailey II, (Harper, $4.00), traces the military, political and scientific decisions required for the act.

RELATED READING

James V. Bernardo has produced an interesting study of modern aviation, missiles, and space vehicles in his work *Aviation in the Modern World* (E. P. Dutton, $5.95). The book is thoroughly researched and well illustrated.

You Ask It

In answer to numerous requests, here is a rundown on new regulations and recent changes of widest USAF interest.

AFR 30-6, 22 July 1960, *Assignment and Occupancy of Public Quarters and Rental Housing.* A complete revision which outlines eligibility requirements for bachelor officer and family type quarters.

AFR 35-5, 18 July 1960, *Guided Missile Insignia.* Prescribes revised policies and eligibility criteria for wearing of the insignia.

AFR 35-12, 22 July 1960, *Military Suggestion Program.* Outlines the latest procedures and contains reporting instructions which govern the program.

AFR 36-5A, 5 August 1960, *Appointment of Officers in the Regular Air Force.* Contains major changes in applicant eligibility and background, and in actions by the major air commander.

AFR 39-30, 16 August 1960, *Administrative Demotion of Airmen.* Explains when, how, by whom an active-duty airman may be demoted to a grade appropriate to his demonstrated skills and abilities.

AFR 39-45A, 22 July 1960, *Proficiency Pay.* Outlines the criteria for award of the newly authorized P-2 proficiency pay.

AFR 50-39, 18 August 1960, *Noncommissioned Officer Training.* Establishes standard major air command NCO courses and the criteria for their operation.

AFR 145-15A, 14 July 1960, *Individuals and Organizations Authorized Commissary Store Privileges.* A major change which prohibits the sale of tax-free tobacco products to all civilian employees in states which impose taxes on these products.

AFR 146-5A, 18 August 1960, *Reimbursement Rates for Meals.* Adjusts reimbursement rates for meals with and without surcharge and for officers and civilians receiving per diem allowances.

AFR 160-41A, 4 August 1960, *Dependent's Medical Care.* The publication adjusts sections covering inpatient care and designating remote area dental care.

AFR 160-114, 29 July 1960, *Rates for Hospitalization, Outpatient Treatment, and Subsistence in Air Force Medical Facilities.* A complete revision of this earlier publication, defining eligibility and governing policies.

AFR 182-6A, 6 July 1960, *Offenses Against the Postal Service.* Contains changes which effect multiple losses of U. S. Treasury checks and gives reporting procedures.

Assignment to Turkey

by TSgt. John K. O'Doherty, *Airman Staff*

AN OVERSEAS assignment to any of the NATO countries of Europe has come to be regarded by most Air Force people as something of a plum to be sought after. Career airmen in particular have long appreciated the personal rewards and spiritual enrichment that result from observing and understanding the cultures of other societies.

Each of the NATO countries to which airmen may be assigned offers its own distinctive features. The pattern of its history, geographic peculiarities, and ethnic characteristics are reflected in the day-to-day life of the people.

For the airman sincerely interested in expanding his personal horizons, there is no more fertile field for exploration than the Republic of Turkey. This vigorous and enthusiastic member of the NATO alliance straddles the geographic boundary between Europe and Asia — a strategic bridge between continents.

The Physical Image

The western part of Turkey is about the size of Massachusetts. It extends from Istanbul to Adrianople near the border of Bulgaria and joins the mainland of Europe. The greater mass of Turkey — bigger than the state of Texas — is the peninsula of Anatolia jutting from the continent of Asia. The two continents are separated by only 1,800 feet of water at the Bosphorous, a narrow strait bisecting the city of Istanbul and connecting the Black Sea with the Sea of Marmara. The Dardanelles, a 40-mile-long waterway joining the Sea of Marmara with the Aegean Sea, has figured prominently in military history for centuries.

It is sometimes convenient to refer to the area west of the Bosphorous and the Dardanelles as Turkey in Europe, and to the larger peninsula of Anatolia as Asia Minor, or Turkey in Asia. The two, however, are integral parts of the independent Republic of Turkey founded in 1923.

Visitors to Turkey find, in general, two types of climate. Along the coast it is generally mild and pleasant, with considerable rainfall on the shores of the Black Sea. On the interior plateau of Anatolia, climate

is dry with extremes of heat and cold becoming progressively noticeable to the east.

In the area of Izmir, along the Aegean coast, climate is at its best. Dozens of picturesque resorts dot the many islands off shore. Summer heat is tempered by soft ocean breezes mixed with the cooling wind sweeping in from the mountains which surround Izmir on three sides. Istanbul enjoys moderate weather, with mild winters. Summers are inclined to be humid.

The climate at Ankara, the capital has been compared to that of Kansas. The city stands on the inland plateau, and there are wide differences in temperature, between day and night as well as between summer and winter. Winter is cold, with snowfall usually beginning in November. Summer temperatures commonly hit 100 degrees, but humidity is low. Nights are comfortable, and a blanket is in order after midnight.

Airmen assigned to Turkey may be stationed at Incirlik Air Base, near Adana. This field is used by Tactical Air Command squadrons on rotational deployment. There are a number of non-tactical activities located in the cities, and several small detachments elsewhere. In any event, the airman will find himself living close to the people of Turkey.

In addition to being a bridge between continents, Turkey is also a bridge across time. It is a country of broad contrasts, with today and tomorrow imposed on the background of yesterday. Ideas and machines of the 20th century are applied on an ancient mosaic of culture that has endured for centuries. Modern Turkey, in effect, presents in miniature a picture of the social revolution that has swept the western world during the past 200 years.

The scene on a downtown street in Turkey differs little from that of any other city in Europe. There are modern shops, parks, tree-lined avenues, and pastel-colored apartment buildings. The people, in western dress, go about their business in stores and offices just like their neighbors all over Europe. Automobiles, buses, trolleys, and taxis throng the streets. There are excellent restaurants, night clubs, and hotels. The familiar faces of Hollywood stars smile seductively from the posters of movie theaters.

Women and girls have a place in the world of commerce and the learned professions. They wear dresses, or sweaters and skirts, like their sisters in New York, London, or Paris. The day of the veiled woman and the harem has passed. The exotic mysteries of the east are gone. At Turkey's six universities, student groups pursue activities like those in vogue all over Europe.

In the older sections of the cities, the picture is different. Narrow, cobblestoned streets may be congested

by ox-drawn wagons, numerous mal-odorous camels, and dozens of donkeys. Small noisy tractors which farmers use as transportation from country to town add to the confusion. Instead of modern stores there are cluttered bazaars in which nothing has a fixed price. Skillful bargaining remains an ancient and honorable art. Water carriers and peddlers of various delicacies add their cries to the babel. The public scribe still has his stand on the street corner, though a portable typewriter replaces the traditional sand box and quill.

The tea houses, restricted by custom to men, are the social centers, and animated conversations may be mistaken by the stranger for passionate, frenzied argument. It is not unusual to see friends meet with an embrace, in the manner of the French. Companions maneuvering through the crowds frequently walk hand-in-hand.

of old Turkey. Others wear breeches akin to jodhpurs, and a good many choose to go about their work barefooted. Numbers of the country people still pause to pray—in the fields or by the roadside—at the appointed five times each day.

More than 50 percent of Anatolia's 200 million acres is devoted to grazing. Countless numbers of cattle, sheep, and goats roam the mountain slopes, on the sides of valleys, and the high tableland areas where rainfall is lightest.

Turkish villages differ considerably in appearance according to altitude, nature of the soil, and the local climate. Several features are common to all. The typical rural community is built around a public well or spring. Nearly all the houses lining the wide street have small gardens or orchards. In the center of the village is the

The Turkish flag, and the memory of Attaturk, "Father of the Turks," are both held in highest esteem by all the people of Turkey.

Ankara, a modern metropolis, is a symbol of Turkish progress.

But only about 20 percent of Turkey's nearly 27 million people live in the cities. The great majority occupy some 40,000 rural communities scattered over Anatolia. They live by agriculture or animal husbandry. Such products as Turkish tobacco, dried fruits, and the fleece of the Angora goat are known all over the world.

Although modern machinery and up-to-date methods are coming more into evidence, the people in outlying districts still cling to hallowed traditions and venerable customs. Women may be seen working in the fields, but rarely on the village street, and never in the tea houses. For the most part, they wear traditional concealing garments that cover the body completely. The old concept of woman's inferior position in the social scale still prevails. She lives a sheltered existence, surrounded by a rigid wall of custom.

Many of the men of Anatolia are bearded. Some wear the baggy trousers resembling story-book pictures

house of the Mukhtar, or headman, elected by residents of the community. Then there is the school, often the best building in the village, and the police station. The mosque is always filled for prayer on Fridays. The more modern villages have tractor and implement repair stations. Grain silos are appearing in greater numbers on the central plateau.

Turkey in NATO

Turkey became a member of the 15-nation NATO alliance in 1952. It is the only country of the western partnership with a border joining the Soviet Union. For centuries coveteous Russian eyes have been directed at the Bosphorous and the Dardanelles, gateway to the Mediterranean. Between 1672 and 1914, Turkey fought a dozen wars with Russia. Each aggression in turn swallowed another nibble of Turkish territory, and there is good reason for the present-day vigilance.

In addition to being "anchor man" of the NATO crescent extending from Norway through Europe to the eastern Mediterranean, Turkey borders also on Iran, thus giving NATO direct contact with the CENTO alliance of like-minded nations. (The Central Treaty Organization, or CENTO, is an alliance for mutual security composed of Great Britain, Turkey, Iran, and Pakistan. The United States participates in a number of CENTO activities and has bilateral defense arrangements with all CENTO countries.)

The NATO command responsible for ground defenses in the area is HALFSEE, Headquarters, Allied Land Forces Southeastern Europe, located at Izmir. The 6th Allied Tactical Air Force, or 6th ATAF, also has its headquarters at Izmir. Commander of 6th ATAF is responsible for training and readiness of three Turkish Tactical Air Forces and one Greek Tactical Air Force.

Turkish military forces have always been distinguished by their discipline and courage. The record of the Turkish brigade serving with the U. N. forces in Korea was outstanding. Two U. S. Presidential Unit Citations were awarded to Turkish forces during the Korean conflict, as well as numerous American individual decorations.

The Turkish military establishment numbers some half a million men. Of these, about 35,000 make up the air element, and 25,000 men comprise the Turkish Navy. Altogether, Turkey maintains the strongest military force in the Middle East. In NATO, Turkey's commitment is smaller only than that of Great Britain, France, and the United States.

Every able-bodied man in Turkey is subject to compulsory military training upon reaching the age of 21. The current arrangement calls for two years of active duty followed by service in the reserve until age 46. The Turkish soldier, or "Asker," receives about three and a half cents per month for the first year of his enlistment, and seven cents during the second. Training is rigorous, by any standards. There are none of the frills or comforts identified with western armies.

Draftees attaining noncommissioned rank wear red chevrons. Career noncommissioned officers whose enlistments are for 15 years wear gold chevrons. The "gold-stripers" command a great deal of respect and prestige among comrades and in civilian communities.

The Turkish officer corps is respected by every level in the community. Professionally, they compare favorably with any officer group in Europe, and they are bound by a rigid code of honor. Altogether, the military establishment has provided a valuable stabilizing influence in Turkey's wrestling with its many problems during recent years.

Old Turkey and the Moslem Religion

The Turks originally appeared on the border between Europe and Asia somewhere about 1000 A.D. Coming from the plains of central Asia these early tribes, the Seljuk Turks, settled on the peninsula of Anatolia and became a significant force.

A study in contrasts. Young women of modern Turkey have adopted the dress and customs of the west. Traditional costume of an earlier generation is rapidly disappearing from view.

Some 200 years later, the Seljuk Sultan gave a strip of land in Anatolia to a refugee tribe which had fled the Mongols from the area of the Oxus River in central Asia. Here, with 50,000 families, the Osmanli, or Ottoman, Turks settled in their new home.

For a time the Osmanlis lived in obscure insignificance. But gradually, being a vigorous and persevering people, they began to absorb the communities around them. From their neighbors they borrowed whatever features of culture they found appealing. The two great civilizations of the day were the Arabian and the Byzantine, or Eastern Roman Empire. The style of architecture which characterizes the beautiful mosques of modern Turkey was copied from Byzantium. Early in the 14th century, Arab missionaries brought the religion of Mohammed to the Turks. This conversion to the Moslem faith proved to be an important influence in Turkey's history.

Emerging from their humble beginning as a pastoral community, the Ottoman Turks turned their faces to the west and established an empire that was to dominate the European scene for centuries.

The Ottoman Empire reached the height of its grandeur under the Sultan Suleiman the Magnificent, 1520-1566. In Europe, Turkish domination extended over an area now comprising the countries of modern Turkey, Bulgaria, Rumania, Hungary, Yugoslavia, Greece, and Albania—right to the gates of Vienna. To the east, the Ottoman Sultan reigned over a part of the present-day Soviet Union, a territory reaching to the shores of the Caspian Sea and the borders of Persia (Iran). But like the Empire of Byzantium which it succeeded and the empires of western Europe which followed, the Ottoman Empire was destined eventually to disappear.

The decay and ultimate disintegration was a lengthy process extending into the 20th century. The reasons are numerous and complicated.

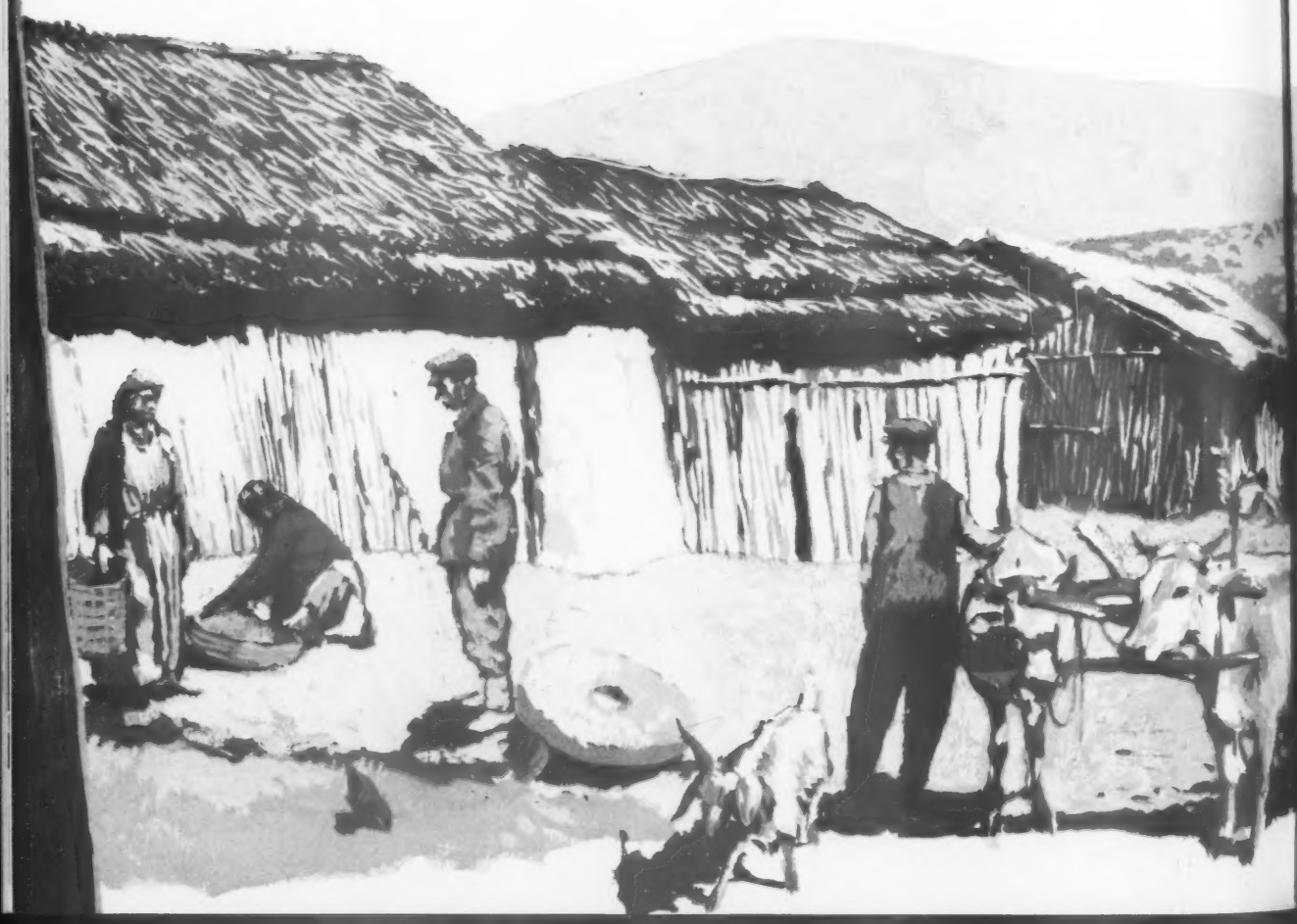
One of the most significant faults in the Ottoman system was the rigidity of the socio-political structure. This arose out of the fundamental doctrine upon which the Moslem religion was founded. In Islam—the Moslem world—it was held that not only religious beliefs but civil law and rules of society were made and ordained by God. They could only be altered by God.

The Sultan was theoretically an autocratic ruler, like the other kings of the Middle Ages. Actually, the law of the land was the Sacred Law of Islam, the Sheria. The Sheria regulated the religious aspects of life and every minute detail of day-to-day existence. Thus the Empire came to be governed by a council of holy men —the Ulema—which interpreted the Sacred Law to suit the occasion. As masters of the Empire, the Turks made no attempt to absorb the minorities. Like the Romans before them, they employed the talents of subject groups extensively. The individual Turk disdained to interest himself in petty administration or business. All such menial work was hired from willing non-Turkish underlings.

To sustain and exploit the orderly flow of commerce, broad concessions were made to foreigners living and doing business in the Turkish domain. These concessions, the Capitulations, included the right of foreign nationals to be heard before their own consular courts. The Capitulations excused foreigners from many provisions of the Sheria.

The Ottoman system worked remarkably well for a time, particularly in the earlier years. But as the Renaissance brought a revival of learning between the 14th and the 16th centuries, Turkey could not keep pace with western Europe in the transition from the Middle Ages to modern times. The Sultan's machinery of government was too rigid to allow for any fundamental change in meeting the new ideas then fermenting all over Europe.

A number of reform movements were organized, particularly as Ottoman power began to feel pressure from the new Slav state expanding ominously to the north. In the early 19th century, Sulton Selim III proposed sweeping reforms based on democratic ideas emanating from the French Revolution. There was talk of separation of church and state under a constitutional government. Selim III envisioned a true democracy in



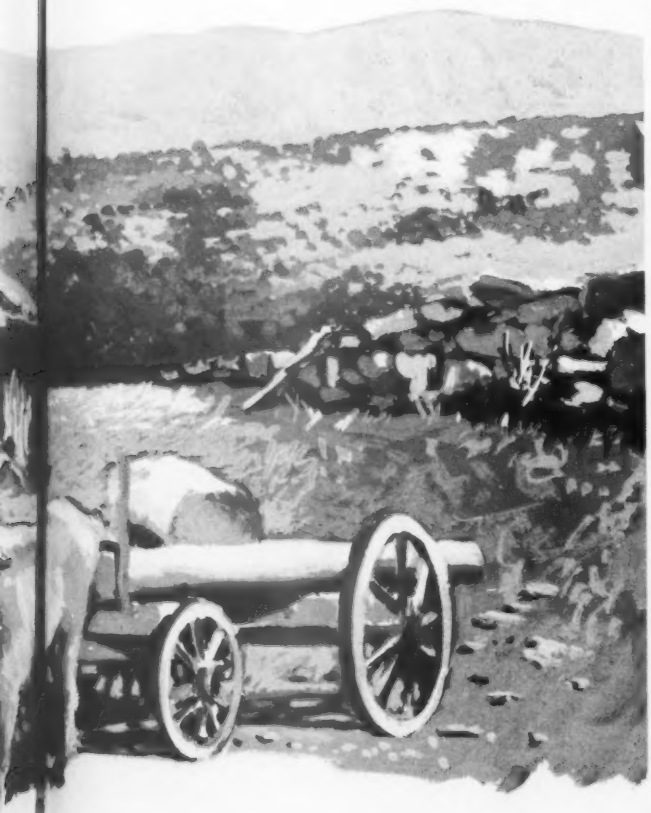
which Christians and Moslems would enjoy equal rights.

Russia, in fierce determination to move south, used all available instruments of intrigue to foment unrest among subjects of the Sultan. Being Christians, the Russians had special influence among the Serbs, Bulgars, and Armenians. These became Russia's fifth columnists. Internal disturbances within the Empire coupled with repeated aggression established the pattern of disintegration. Turkey became known as the "Sick Man of Europe" as the Empire withered.

Greece won independence in 1829, and Rumania in 1856. Bulgaria was lost in a war with Russia, 1877-78. Egypt drifted away, and the other North African provinces fell under control of west European powers. By the end of World War I—in which Turkey backed the Central Powers in their opposition to Russia—the Empire was reduced to a triangle of land 30 miles by 40 immediately surrounding Istanbul.

Attaturk and the Modern Republic of Turkey

The architect of democracy and founder of the modern Republic of Turkey was Mustapha Kemal Attaturk. His memory is honored among his countrymen with a reverence similar to that accorded by Americans to Washington, Jefferson, and Lincoln.



In 1919 Turkish power was completely broken and the people sunk in the despondency of defeat. Mustapha Kemal, already a national hero as a soldier, rallied his countrymen in a move to preserve Turkish independence. The peninsula of Anatolia, traditional home of the Turks, was regained.

By 1922 the Sultanate was abolished and the last of the line, Sultan Vaheddin, banished into exile. In 1923 the Republic was proclaimed. The Sheria, as applied to secular matters, was swept away by 1925, although devout Moslems still observe the Sacred Law in the conduct of their private lives.

Over the next several years under the leadership of Mustapha Kemal the constitution was repeatedly revised. Turkish statesmen borrowed liberally from the political principles of the west in severing the ties between the old order and the new. In conjunction with the program of political reform, Mustapha Kemal simultaneously attacked the problem of revising social and cultural features of the nation. Some of his innovations had to be supported by force as the traditions of centuries could not be uprooted easily.

Wearing of the fez, a symbol of the past, was forbidden. The Arabic alphabet was abandoned, and Roman characters substituted. (Students had difficulty with the old alphabet of 127 letters.) The use of family names became obligatory. The name Attaturk, meaning Father of the Turks, was conferred on Mustapha Kemal by the Grand National Assembly. Sunday was adopted as the day of rest rather than the Mohammedan Friday. Religion was declared a private matter, and western influences were introduced into music and the other arts. The many statues and portraits of Attaturk seen in modern Turkey reflect this effort to modernize Turkish art. In the old order, portrayal of living objects in any art form was prohibited.

Women in the old empire had almost no rights. A wife could not ride in the same carriage as her husband. She did not eat with her spouse. The harem she shared with other wives or concubines was a virtual prison. Her face was forever veiled from the sight of strangers.

Today women enjoy equal divorce rights with men. Polygamy is prohibited. In December 1934 a law was passed giving women the right to vote and to stand for election to public office.

Up until his death in 1938 Mustapha Kemal worked tirelessly to introduce modern methods to farming and industry. State banks were organized to promote manufacturing and marketing. He rebuilt the old city of Ankara into a modern capital, and modernized the ports of Istanbul, Izmir, and Samsun.

One of the greatest memorials to Attaturk is the intense interest in education among the rising generation. Early in his career he recognized that democracy can flourish only in the presence of a large, relatively well-educated middle class. Special emphasis was placed on training school teachers. Elementary education is now free and compulsory, and the prescience of Attaturk and his associates is being vindicated by the results.

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The only NATO country bordering on the Soviet Union, Turkey keeps constant watch on the north.

The American in Turkey will find the people generally friendly, but reserved. Their pleasures are simple, and they possess a lively curiosity about everything around them. A minor traffic accident on a city street may attract a large crowd. In rural areas where the sight of an American is still a novelty, a Turk may walk up close—face to face—for a good look at the stranger. This may be disconcerting to Americans, but it is in no way intended to be unfriendly or impolite.

In social contacts Americans will quickly learn that the Turks hold very definite opinions in certain areas. The Turkish flag symbolizes the history of the nation and its leaders. It is revered to a degree bordering on worship. The slightest disrespect can arouse violent reaction, as well as land the offender in jail.

The Turkish Army is similarly held in high esteem. At the present time an Army group temporarily controls the machinery of government pending a new revision of the constitution. In addition to its role as protector against aggression from the Soviet Union, the military establishment is regarded as the repository and guardian of the ideals and aspirations of Attaturk. This veneration of the national personality extends into every level of society. Even the humblest of government officials are accorded utmost respect.

Standards of social conduct are high in Turkey, particularly where women are concerned. Casual social relationships so common in western countries verge on immorality in Turkey. A man never speaks to a woman to whom he has not been properly introduced. Any public display of affection, such as holding hands, is considered disgusting.

Even in the cities, the husband and head of the family usually occupies his own portion of the house. Here he eats and receives his friends. A visitor should not be surprised that the host does not introduce his wife. Young girls are taught from childhood never even to raise their heads in the presence of men.

There is of course considerable social contact between Americans and their Turkish friends. But a gentleman never asks a lady to dance. He poses his request to her escort. And the American who meets a gracious and friendly lady at a formal gathering should not be surprised when she ignores him upon meeting again in public. If she behaved otherwise, she would be subject to criticism. Any interest—even if completely innocent—evinced by a foreigner toward a Turkish woman can lead to trouble. The Turkish social system deals very severely with females who lay themselves open to the slightest suspicion of their morality.

Another important facet of Turkish society is the universal respect for the person. Insult or assault will result in jail sentence. Even the mild semiprofanity casually used by military men can be construed as insult and practically any contact with the hands can be interpreted as assault.

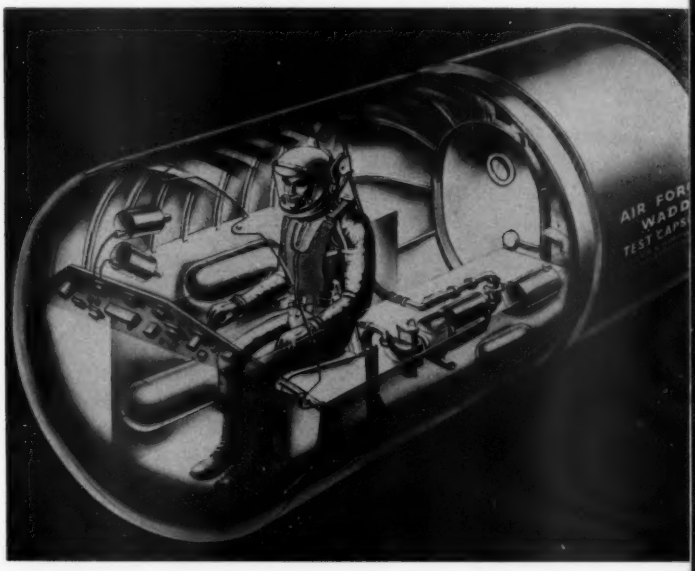
Americans will also do well to familiarize themselves with those Turkish laws pertaining particularly to military personnel. Because of economic difficulties and problems of foreign exchange, Turkish customs regulations are exceedingly strict, and strictly enforced. Memory of the Capitulations—the privileges granted to foreigners under the sultans—makes the Turks especially sensitive to misuse of BX or commissary merchandise by Americans. Penalties are severe. Law enforcement is swift and direct.

There are other pitfalls of trouble in Turkey very similar to those found in any other part of the world. The Moslem religion prohibits the use of alcohol, but modern Turks are less rigid in observing this than their forefathers. Light wines and beer are consumed, but there is never any evidence of over-indulgence among the Turks. Drinking establishments in Turkey, as everywhere, sometimes attract females of questionable reputation and an enormous thirst. In Turkey these women are almost exclusively members of the non-Turkish minorities residing in the country. They are treated with contempt by the Turks, and the contempt extends to those who associate with them.

Turkey Looks to the Future

Attaturk's vision of the new Turkey has not yet been completely realized. There are problems in economics and industrialization. The perennial threat of aggression from the north constitutes a drain on the national budget. But in comparing Turkey with the other Democracies of the West it must be remembered that the new nation came suddenly out of the Middle Ages without a preparatory period to ease the transition. The burden of handicaps carried over from the past is gradually disappearing as each year brings a new step forward. A U. N. report on Turkish accomplishments carries this fitting reference to the Turkish people: ". . . a hard-working, serious and courageous people whose progress in a single generation is one of the salient events of modern world history."

THEORY — Prologue to FACT



by SMSgt. Hal Bamford

IT IS axiomatic that successful flight didn't "just happen." The Wright Brothers spent literally hundreds of hours testing, checking, experimenting, and retesting theory before achieving success 57 years ago this month at Kitty Hawk.

The thoroughness of these two Dayton, Ohio, pioneers set the pattern for the future, for as aerial operations progressed to the first steps of aerospace operations, theory became even more important as a necessary and vital prologue to fact.

Too much emphasis can never be placed on the safety of the individuals who may be asked to take the first step into the unexplored vastness of space. Consequently, two late developments—a laboratory space capsule and a test-pilot monitor—should do much to increase man's knowledge of the dangers to be encountered in space.

The first to venture forth into this new environment will be subjected to many stresses resulting from heat, cold, oxygen and pressure conditions, and other factors. Although the space capsules developed to date have been successful in providing answers to many of the questions concerning these stresses, they are limited because only one stress can be studied at a time.

It is the interaction of several stresses that has been the concern of physiologists and psychologists, and the new space capsule being designed for the Air Force will simulate several stresses simultaneously.

Inside, the test subject will be able to choose either a "shirt-sleeve" atmosphere or use of a pressure suit. Various gaseous mixtures such as those anticipated in space can be duplicated. Additionally, heating, such as may be encountered during reentry, and reconditioning of exhaled breath will also be capable of simulation. The capsule will be adaptable for use in pressure chambers or on a centrifuge adding further to its value.

A second giant step in the protective shield being built around further space explorers is a test-pilot monitor, capable of telling at a glance the immediate condition of both pilot and vehicle during test sequences.

Designed to be operated by ground personnel, it will provide current reports on the pilot's physiological and environmental condition while the flight is still in progress. Concurrently, it will also receive and translate information on the physical state of the test vehicle itself.

An electronic console will be provided for ground monitors which will automatically translate information received without computation or interpretation on the part of the monitor. Because this information will be available within fractions of a second of its actual occurrence, the monitors will be able to signal the vehicle immediately in the event of an emergency which may not be evident to the pilot himself.

The console will be separated into two units—vehicular and physiological—each about half the size of a normal office desk. A flight test engineer will man the unit monitoring such vehicular information as stability structural strain, power plant behavior, skin temperatures, and similar data. A flight surgeon will read the information concerning the pilot's heart rate, blood pressure, temperature, respiration, as well as pertinent environmental information.

Specifically designed to monitor flights by experimental, high-performance craft such as the X-15, it will also be adaptable for use on space vehicles which will be utilized during current man-in-space projects.

Possibly the degree of check and recheck might shock the Wrights were they alive today, but the principle they so rightly pioneered remains as a tribute to them. As man in space draws ever nearer to reality, its application becomes ever more important and more evident.

NUCLEAR WEAPONS AR

by SMSgt. Edison T. Blair, *Airman Staff*

EVERYONE knows of the tremendous destruction that a nuclear weapon can accomplish through heat, blast, and radiation. It is also common knowledge that every single one of our B-52s on alert is armed with more destructive power than was contained in all the high-explosive bombs dropped by both sides in World War II. This destruction is packaged in highly concentrated weapons designed to penetrate the hardest of the enemy's military fortifications. Now, during peacetime, these potent weapons are carefully tended here at home.

Also our key cities are now guarded by nuclear-nosed interceptor missiles. New intercontinental ballistic missile sites are constantly being built to launch more powerful missiles. Soon the mobile *Minuteman* ICBMs will be mounted, fully armed with atomic warheads, on trains moving on our railway system. Altogether this amounts to a lot of destructive power in our front yard.

Several atomic weapons have been destroyed by accidents that caused considerable concern and alarm on the part of both military and civilians. There is an unreasoning fear that an accident some day will unleash a typical mushroom-shaped cloud with all its destructive blast, heat, and radiation. Such fears are groundless, as you will see, and you don't need to be a nuclear physicist or even have a lot of technical training to understand why.

Accidents are the number one problem in nuclear safety. There's no complete cure for accidents just as there are no completely safe weapons. Weapons are dangerous because they are intended to be dangerous. Reliable weapons are dangerous only when you want them to be dangerous, and nuclear weapons are the most reliable ever conceived by man. Mathematicians for the Defense Atomic Support Agency (DASA) will give you odds of a trillion to one that there will never be an accidential nuclear explosion. They base their prediction on what they have learned about nuclear weapons in 15 years of experience dating from the Manhattan Project. They also know that most accidents are the result of human error. Human error is the second problem in nuclear safety.

There is still a third safety problem and it too, involves humans—saboteurs and psychotics. These could be enemy agents, or some guy just mad at the world in general. Such a person might deliberately attempt to explode a nuclear weapon even at the sacrifice of his own life. The best way to prevent such actions is through proper security measures. Thus, security becomes the fourth problem in the safety of nuclear weapons and materials.

Security often means classification of certain information and may require physical restraint. The necessity for classification and security has contributed to misinformation, lack of understanding, and distrust of our own nuclear weapons which are the reasons for this article. Later, we will discuss the safety standards designed to cope with the problems mentioned here, but before we go any further, let's take a look at what it takes to make a nuclear explosion.

First, of course, you need the nuclear—or radioactive—materials used in the weapon. Some of these materials, such as uranium, have existed in nature as part of the earth's crust since Creation. Others, such as plutonium, are artificially created by man.

The main difference between natural uranium and ordinary lead is that the unstable uranium atom is literally bursting with energy. About once in 4.5 billion years a uranium atom may "explode" and lose part of its energy when a tiny particle of its nucleus blasts off into space. These *alpha* particles, as they are called, don't go far when radiated from the materials we know. In fact, they don't have enough energy to penetrate your skin or even the paper on which this is printed.

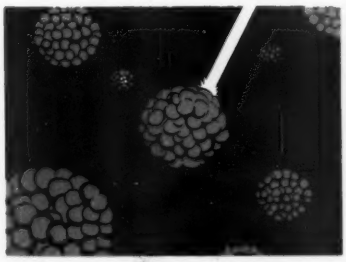
The uranium atom gets all shook up by the loss of *alpha* and it becomes more unstable than before. This condition lasts a few more billion years until one of its *beta*, or electron, particles goes kiting off into space to find a new home. This leaves matters still worse in the parent atom, and other exuberant *alphas* and *betas* take turns desert-

ing the homestead. Naturally, with each desertion the atom becomes more and more agitated. It loses so much weight that it presents an entirely new face to the world—in fact, it actually becomes an altogether different chemical element. It becomes radon, then radium, then polonium until, with one final burst of energy, it kicks out one more *alpha* particle and sinks into its final state of lead, to spend eternity.

The eons, ages, millenniums, centuries, and years between changes are called the "half life" of the element. For example, take the case of a radioactive particle with a half life of, say, five centuries. In that course of time the substance dissipates one half of all the energy it originally possessed. In the next five centuries it will lose one half of the remaining energy. Then in the third five centuries it will lose one half of the energy retained after the second phase of radioactive decay. And so on down through the centuries until all its energy has finally been released.

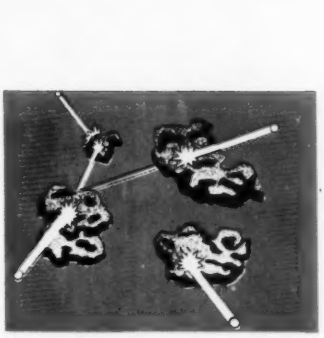
Other radioactive elements undergo the same sort of change as uranium except that they do not necessarily evolve into the same new elements. They have different half lives, some existing many years, some for only a very small fraction of a second, before decay.

Substances that decay like this are called radioactive materials and you can find them all around you in your backyard, in your bedroom, in your pocket, and on your body. The luminous hands on a clock or watch are made luminous by *alpha* and *beta* particles bombarding the paint. Plants, both living and dead, contain some radioactive materials. However, these natural "explosions" that emit radioactive particles are not the same thing as a nuclear explosion. Nuclear material releases its energies with the tremendous force of an atomic bomb only when many atoms are split (fissioned) completely and instantly. A nuclear explosion accomplishes in one millionth of a second what nature does in 35 billion years. The accompanying drawings explain this better.



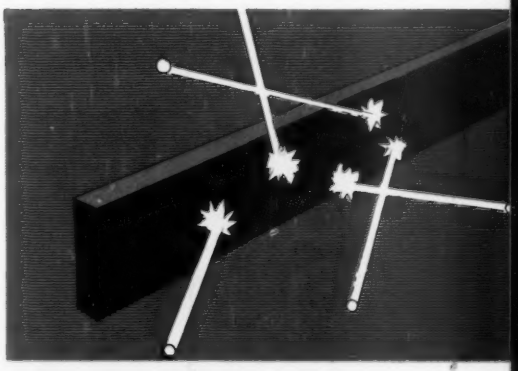
1. When the nucleus of an atom of active material such as uranium 235 or plutonium is struck by a neutral particle called a neutron, the atom splits or fissions into two parts.

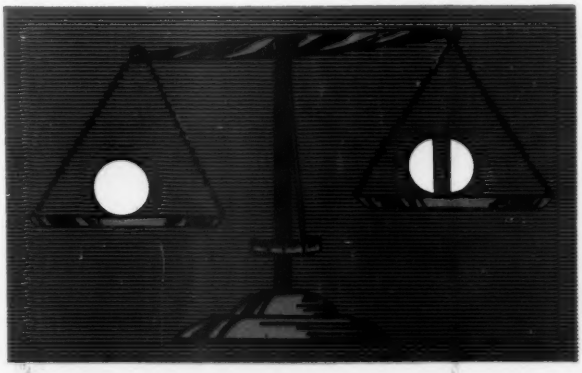
2. The combined weight, called the mass, of these fission fragments is less than that of the original atom. The lost weight, or more correctly, the mass, has been converted and released as nuclear energy—blast, heat, and radiation.

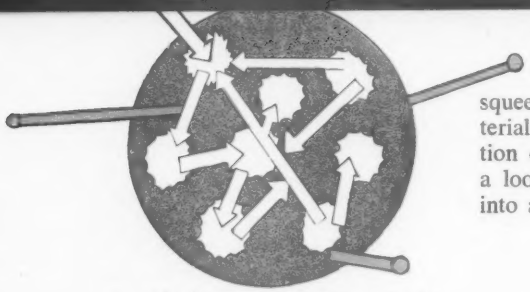


3. Since stray neutrons are always present in an active material, there are limits to the amount of such material that can be assembled without producing a premature nuclear reaction.

4. If the amount or shape of the active material is such as to permit the neutrons given out by spontaneous fission to escape after only a few fissions, the nuclear mass is subcritical, and does not contribute to a nuclear reaction.

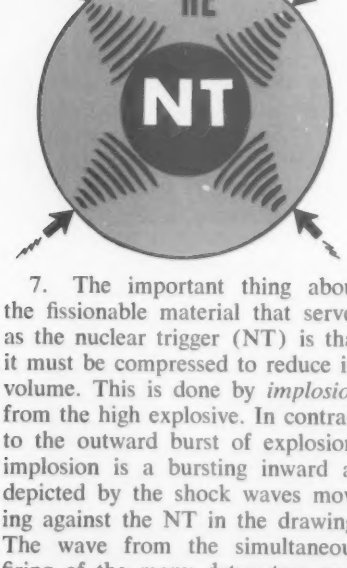




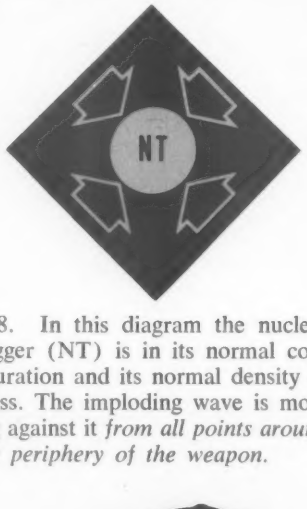


5. If the configuration of the amount of active material is such that one neutron from each fission does not escape, and it goes on to fission a new atom, a continuous self-sustaining action known as a chain reaction is created and the mass is critical. In order to produce a super critical mass and its resulting nuclear reaction, or explosion through fission, the mass is compressed and atoms squeezed tightly together.

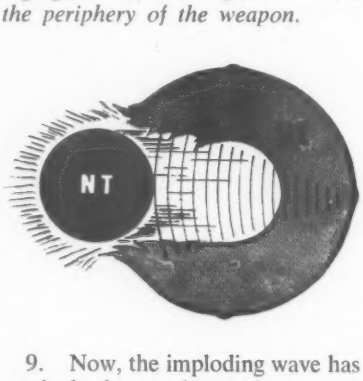
6. That's why most atomic weapons contain various quantities of conventional high explosives (HE). The HE does the squeezing. The nuclear component or nuclear trigger (NT) may be contained with the high explosive as shown.



7. The important thing about the fissionable material that serves as the nuclear trigger (NT) is that it must be compressed to reduce its volume. This is done by *implosion* from the high explosive. In contrast to the outward burst of explosion, implosion is a bursting inward as depicted by the shock waves moving against the NT in the drawing. The wave from the simultaneous firing of the many detonators propagates inward to compress or squeeze the mass of fissionable material much as the simultaneous action of your fingers would squeeze a loosely crumpled sheet of paper into a tight wad in your hand.

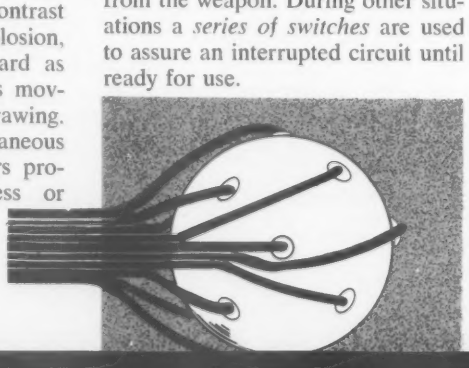


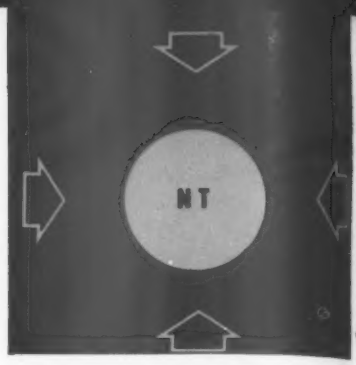
8. In this diagram the nuclear trigger (NT) is in its normal configuration and its normal density of mass. The imploding wave is moving against it *from all points around the periphery of the weapon.*



9. Now, the imploding wave has reached the nuclear trigger and squeezed or reduced its volume, bringing its atoms close enough together to sustain a chain reaction.

10. *The important thing to remember is that to produce an atomic explosion there must be split-second simultaneous detonation of the explosive charge around the nuclear trigger.* The surrounding detonators to produce this simultaneous action are connected through a *series of firing contacts* to the electrically powered fusing and firing system. In storage the batteries are isolated from the weapon. During other situations a *series of switches* are used to assure an interrupted circuit until ready for use.





11. Should detonation at any single point on the surrounding skin occur from fire or shock as a result of an accident involving a nuclear weapon, the shock wave moving from that point would seek to escape out the other side because no shock wave from the opposite side would impede it. This would simply release and perhaps scatter the active material. It would not release its tremendous nuclear energy because there would be no implosion, hence, no squeeze, to reduce the mass and make the nuclear trigger go critical.

This is what happened in one of the nuclear accidents we mentioned before. The bomb-release mechanism in a B-47 flying over Florence, S. C., in 1958, malfunctioned and the atomic bomb it held plummeted into the front yard of a local citizen. Impact set off the high explosive and the resulting blast damaged three homes and injured several persons slightly. There was no release of nuclear energy.

Last June a *Bomarc* missile armed with a nuclear warhead burned in its bunker at McGuire AFB, N. J. An investigating committee reported that the warhead "reacted exactly as safety design features and repeated tests on similar weapons assured: it burned and melted harmlessly on the floor of the shelter."

You can see then that positive measures are designed right into the weapon to prevent a nuclear yield in case it is jettisoned or involved in an accident. This is the safety standard established to cope with the problem of accidents. First, the weapon is built so that it won't start a chain reaction even though the high explosive element is set off by fire or impact. Secondly, when the weapon is in storage, the battery

which supplies electrical power to the detonators is completely isolated from the weapon.

Even when the battery is present, a series of several switches insure that the circuit is kept open to the detonators until they are deliberately closed in a specific sequence of actions. Each of these is checked and double-checked frequently to assure that they operate as intended. Certain specific rules are established and enforced by constant safety reviews, or the weapon cannot be used.

There are also positive measures to prevent inadvertent arming, launching, firing, or releasing the weapon—in short, to cope with the human error problem. Some of the controls for safety switches are sealed or locked in the safe position. No amount of fumbling in the dark could accidentally close them. You must deliberately break the seal or perhaps use a key to open a lock before activating the switch. Even then there are two or more switches connected in series but located in different places.

The drawing below shows such a safety device. Before the power can be turned on, the selector switch knob must be turned. But in order to turn the knob, the mechanical locking pin must be withdrawn. The pin can be withdrawn only if the safety seal is broken and removed. So you see, four deliberate actions must be performed before this one switch can be thrown.

Still another precaution is taken to make sure that someone doesn't goof because he doesn't realize what the switches are there for. Skilled technicians must be present when *anyone* has access to the weapon. For instance, another member of the aircrew doing routine maintenance would have a highly qualified supervisor looking over his shoulder every second to see that the wrong switch wasn't moved.

The same type of measures are applied to prevent saboteurs or psychotics from deliberately arming, launching, or firing the weapon. Two or more persons with the same technical qualifications *must* be present when anyone has access to the warhead, or even the missile if it is wedded to a warhead. In many cases, a team of two or more persons is required anyway because of the different locations of the switches. Sometimes only one person has the key to a locked switch.

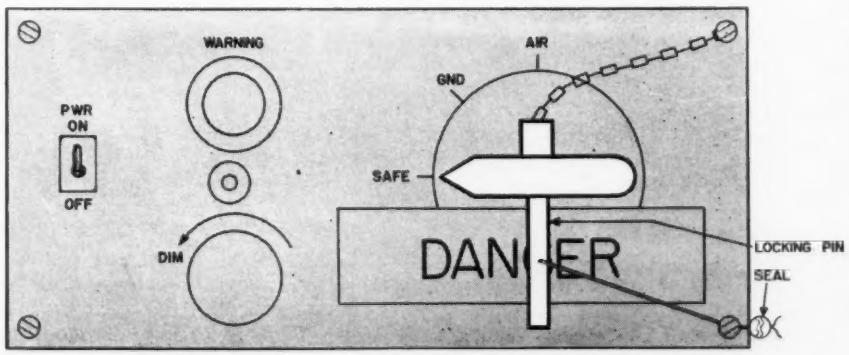
There are always two, and frequently many more, switches. Some of them are concealed or locked. Some are in the machine that carries the weapon and some are in the weapon itself. It is possible to place one or more safety switches in hard-to-get-at places so that a person would literally have to tear the weapon apart to close it. The switch would provide the safety for which it was designed until the weapon is actually delivered against the enemy. Such a switch is not intended to be closed by a person. It closes itself as the result of a sequence of other actions after the bomb or warhead, already in trajectory, senses that it is being used against an enemy as it is intended to be used. This is what we meant when we said that nuclear weapons are the most reliable weapons ever conceived—they are safe until they are intended to be dangerous.

Besides all these mechanical restraints and procedures there is physical security. We know that nuclear weapons are kept in fenced-off, restricted areas and concrete vaults and that only certain authorized persons are admitted by the armed guards. Elaborate alarm systems detect intruders in these areas. Finally, security clearances are granted only to carefully selected, highly trained, and reliable people. The training is exacting and the personnel investigations of everyone even remotely concerned with nuclear weapons is extremely thorough.

Every possible avenue for error is explored in the design, production, transportation, storage, and operation of nuclear weapons. Even before a new weapon is developed, specialists from the Department of Defense (DOD) and the Atomic Energy Commission (AEC) study it carefully to see that all safety requirements can be met. At least two other special studies are made before the weapon goes into operation by a study group who works without any pressure of time. Safety rules must be agreed upon by the Air Force, DASA, the Joint Chiefs of Staff, the Secretary of Defense, and AEC. If the weapon is to be carried in an aircraft during peacetime, the President himself must approve the safety rules.

Air Force inspection teams and DASA teams, acting for the Secretary of Defense and Joint Chiefs of Staff, periodically check training, field, and operation systems with a careful eye for sabotage and carelessness. (See p. 2, March 1960 issue of THE AIRMAN). There is a constant careful review of safety factors and operation of the weapon by the using service who recommends improvements in both design and safety.

But despite such care, the fact remains that no weapon is ever completely safe. The biggest single hazard we can expect from our own nuclear weapons is in the high explosive they contain. In this respect they are no different from our old TNT bombs. A nuclear weapon



may contain several hundred pounds of HE and the safest place to be in case of an accident or fire involving any atomic weapon is at least 1,500 feet away. If possible, make it 1,500 feet *upwind* so you can stay out of the smoke.

It is quite likely, in case of either fire or an explosion of a nuclear weapon, that the active material will be widely scattered and the smoke will contain some of the active material. Plutonium is the most active material used in our weapons and if you guard against it you will be safe enough from other materials. Plutonium is not a hazard if it remains outside the body because it is an *alpha* emitter. Particles could be swallowed, inhaled with smoke, or could enter the body through cuts or breaks in the skin.

Even so, it is unlikely that you could inhale enough active particles to do serious damage, because safety restrictions limit the number of weapons stored or transported together. Thus the total amount of plutonium that could be involved in an accident at any one time is usually limited to a relatively safe amount.

All of this adds up to an intricate series of carefully considered, deliberate actions by several responsible individuals to produce a nuclear yield by the weapon *only when a yield is desired.* Then it stands to reason that there is little to fear from our own nuclear weapons. If you still aren't convinced take a look in your base Technical Library for the *Joint AEC-DOD Technical Information Bulletin,* dated September 1958, which covers the hazards, precautions, and procedures that everyone should know about atomic accidents. Then AFR 121-14 lists enough Air Force directives to tell anyone except a bombardier or munitions chief everything they could ever need to know about nuclear weapons and their dangers.

IN THE BEGINNING

by Capt. Allen R. Robertson, Webb AFB, Tex.

Since windy, wintry dawn, when the signal was hoisted over the squat, blockhouse-like building to warn that this was the day of launching, the hours had ticked away almost audibly. Now it was nearing midday and the last minutes were slipping by, a linked chain dragging future into past.

The man glanced from the whirling anemometer to the sweeping hand of his watch. His palms were sweaty. Seconds now! Only twelve seconds! . . . *eleven* . . . *ten* . . . *nine* . . . He squinted upward into the quadrant of sky where the pale slab of moon had earlier disappeared.

The last wisps of fog disappeared, burned away by the climbing sun. Light now glittered on the sands of spit and dune, and bounced from the white-flecked Atlantic stretching to the eastern horizon. Still, it seemed unseasonably cold, especially this far south, and with 10 o'clock almost half an hour gone. The man found himself counting under his breath.

". . . *eight* . . . *seven* . . . *six* . . ."

Workers and observers alike were stilled, their earlier busy chatter hushed. Tinkering done, minute adjustments made, they waited now in safety for the first blast of the engine that would fling a human being to immortality and an unknown destiny.

". . . *five* . . . *four* . . . *three* . . ."

The machine, which had looked huge in the darkness, seemed even taller now in the daylight. To the man lying prone within it, the inert machine felt impossibly heavy—as leaden a part of his body as his thudding heart. Suddenly he sensed black waters of doubt rising; surely such a tremendous weight of frame, steel, and tanks of explosive fuel could never rise along that path plotted so painstakingly on drawing boards and so indelibly in minds and hearts! Perhaps a new age *was* being born, and maybe he *would* help to usher it in. But, then, again . . .

For a flash, the desire to feel earth beneath his feet fed panic. He almost shouted, "Don't throw that switch!" But they couldn't stop now!

". . . *two* seconds . . . *one* second . . ."

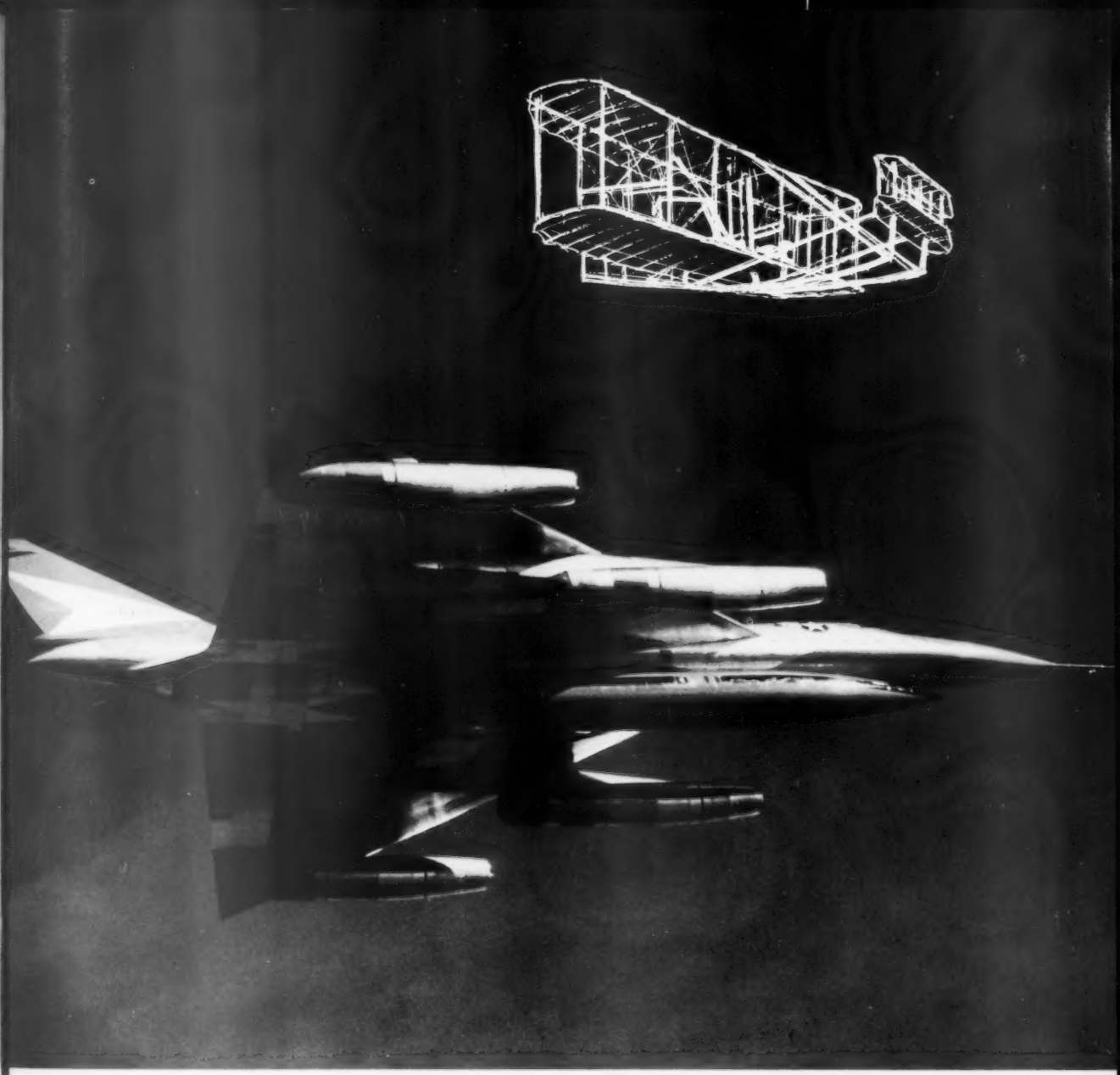
Outside the machine, his feet implanted on the earth for which the man in the vehicle yearned, the first man's eyes were fixed on the machine. His thoughts, however, were tuned almost telepathically to the mind of the man inside, sharing the second's elation, tasting his fear. Slowly his arm rose. Surely the circling sweep-hand of his watch must have accelerated! 10:30 was upon them.

". . . *no* seconds . . . *NOW!*"

The arm lashed down; black smoke belched and billowed; there mounted a strange, clattering roar.

Miraculously the machine came to life, wavering at first as every man present mentally pushed the vehicle upward—observers and workers, the key man standing by, and that lonely man at the controls. Then gathering speed along the launching track, the dream of centuries slowly became reality, the impossible was made possible, and the machine rose!

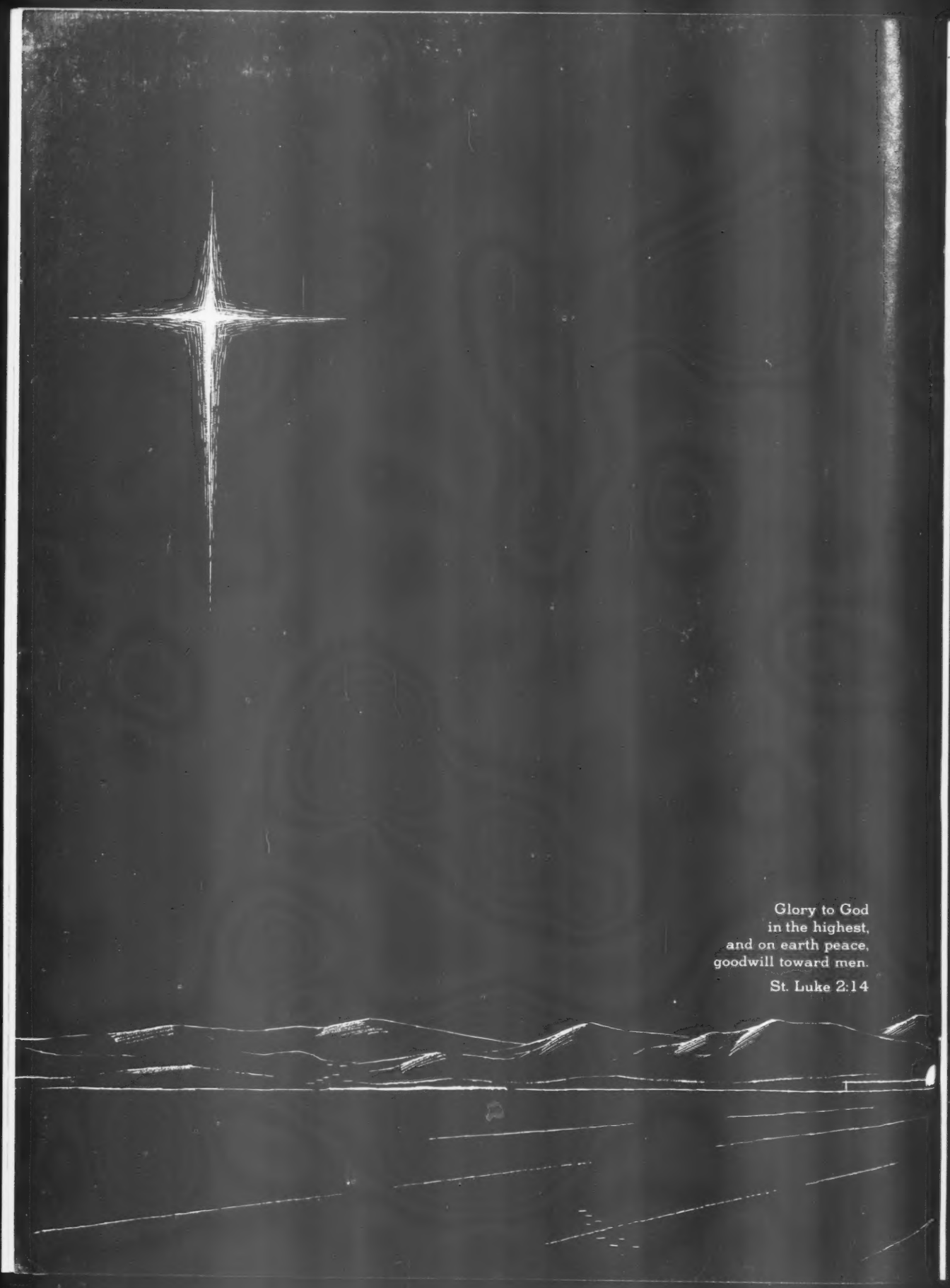
It climbed and it flew! And it landed 12 seconds later, 120 feet away. On that day at Kitty Hawk, N. C., December 17, 1903, borne upward by wood and iron and muslin, man had taken his first stride into space and was on his way to the moon.



HOW BIG IS AN IDEA?

On December 17, 1903, Orville Wright flew 120 feet in 12 seconds.

Today, *less than a single lifetime later,* the B-58 *Hustler* flies nearly 3,000 times as fast.


Glory to God
in the highest,
and on earth peace,
goodwill toward men.
St. Luke 2:14